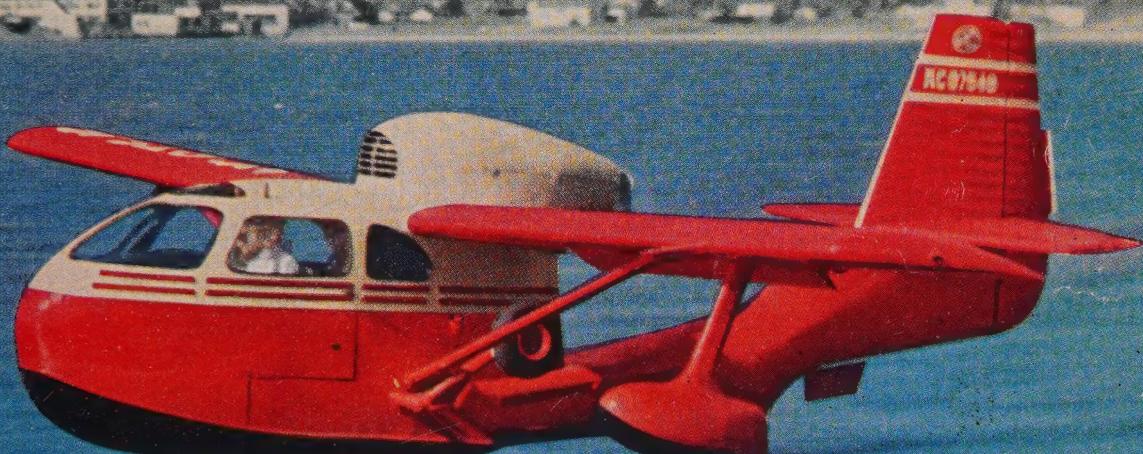


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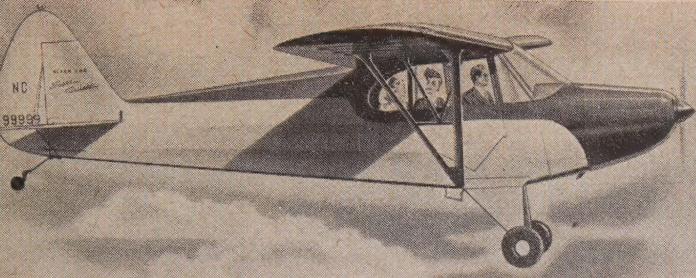
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THE Piper Cub Super Cruiser is tops in the moderate price field today for value, safety and economy. See . . . fly it . . . compare it with other personal planes! The Super Cruiser seats *three* people. There's power to spare in its full 100-horsepower engine . . . and speed up to 15 miles per hour. You can make fast, safe trips of more than 600 miles at normal cruising speed without refueling . . . and 700 miles at economy cruising speed!

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PIPER

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The Birdmen's Perch

By Major Al Williams, ALIAS, "TATTERED WING TIPS,"
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.



Who do you suppose is the oldest licensed pilot in the country?

We think maybe the first private pilot to enter this year's Sixth Annual Gulf Air Tour to Florida rates the honor.

He was Louis C. Dornbusch, from New York City—65 years old and with better than 900 hours! Ask him how he learned to fly at 58, and he says, "Anyone can learn—just start flying!" (Seems logical, doesn't it?)

Two days after he got his private license in 1941, Dornbusch entered the Fourth Annual Gulf Air Tour. But instead of terminating at Miami, he sizzled right along to Havana.

"Visited some friends," he explains.

We didn't find anyone in the Air Tour group who could top Mr. Dornbusch. But there were jillions of pilots who came down to Florida, and we doubt if we

talked to all of them.

So if you're an older pilot—or know of one—will you let us know?



We see where an 8-year-old farm kid has 35 hours' worth of flying time!

Although he has to wait 8 more years before he can get a solo ticket, he's already a past expert at shooting landings.

Well, sir, if this laddie is old enough to set down a flying machine, he's old enough to learn the facts of lubrication. So look here, Johnnie . . .

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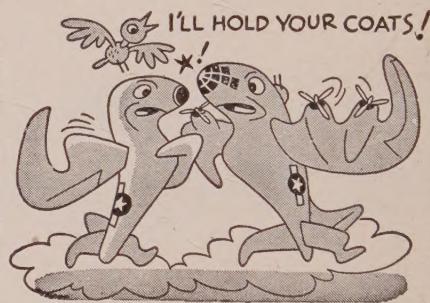
"Gulfpride Oil!"

LITTLE KNOWN FACTS DEPT.

Here are this month's fascinating "Little

Known Facts About Well Known Planes."

They're good . . . they were accompanied with proof . . . and their senders have received beeootiful commissions as Perch Pilots (bottom rung), just as you can if your "Fact" is good enough to print and arrives (address above) with proof.



Bob Stackowisk, LaSalle, Ill. is a Perch Pilot (br) because:

"The XP-81 has about as much power as the 4-engine B-29!"

And Richard Thwaites of Grand Rapids, Mich., qualifies with:

"The XB-36 has enough power to run about 90,000 model planes of average size (at 1/5 hp per each)!"

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SKYWAYS

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These are the newest off the aeronautical drawing boards

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There are two Skyways: English and Spanish

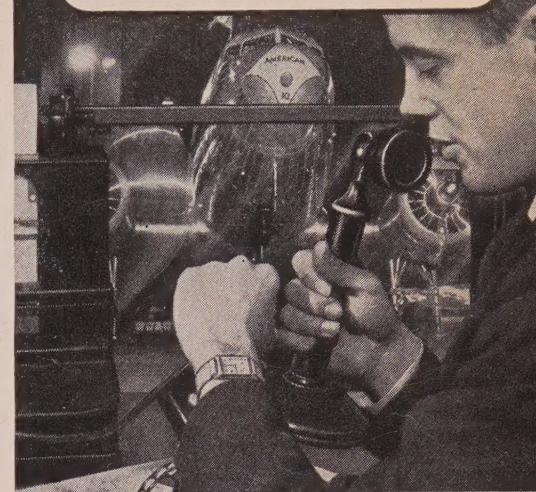
MARCH 1947

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Field of Export Open

AN EDITORIAL

REASSURING developments are afoot in the personal plane export field, especially where Latin America is concerned. They come at a time when the domestic market is still suffering from its serious—though anticipated—slump.

As we go to press, there is every indication that the irritating and stultifying wartime controls will be lifted, allowing U.S. manufacturers the desired freedom to export to the other countries of the Hemisphere which offer excellent sales possibilities.

Full credit must be given for the work that has been done by the Export Department of the Aircraft Industries Association and the Office of International Trade of the Department of Commerce (formerly the Bureau of Foreign and Domestic Commerce). If the President accepts the recommendation—and there is no reason to think that he will not do so—then all non-restricted equipment can move with complete freedom, so far as the United States is concerned.

There is now every indication that the Munitions Control Division of the State Department and the Munitions Board will recommend to the President relaxation of controls on sale of all civil and commercial aircraft. The situation regarding engines is more complicated since some of the larger models are used on both transports and heavy bombers. The solution will probably be to divide this equipment into restricted and non-restricted categories.

The State Department is still faced with repercussions from the earlier scandals created by sales of bad war surplus equipment, largely through irresponsible, fly-by-night operators who misrepresented the materials they handled. Coupled with overeagerness on the part of some Latin-American purchasers, and a lack of proper supervision by our own Government, the results made for bad will in some places. The State Department is now, however, in a position to control such operators and there is very little of the war surplus remaining to cloud the picture.

Competition from the British and the French is already active, but this is not liable to affect our personal-plane manufacturers to any great extent, since neither nation has any really comparable planes. The British *Auster* is the only one which falls into the personal-plane class that is ready for the market and this sells in England for \$4,000, making it more expensive than its American counterpart, the Piper three-place *Cruiser*. There is almost negligible competition from native manufacture.

Charles Cook, chief of the Aircraft Section of the Office of International Trade, who with John Payne of AIA, has done most of the spade work for relaxation of controls, is extremely optimistic about sales opportunities. "The principal difficulty that will remain," he says, "will be on the question of releasing dollar exchange in countries which are short of dollars. Latin America is sold on our personal aircraft, especially the three- and four-place models. We estimate that

there is an immediate market for over 2,000 aircraft. Argentina alone would take about 600 and there is no exchange problem there. Brazil is somewhat short of dollars but not to a serious extent and she can absorb about 500 ships. Venezuela has no difficulties and will buy about 100, while Uruguay, which is wealthy and has a plentiful dollar supply, can take from 100 to 150. Colombia, in the Andean *alto-plano*, is too high for successful personal-plane operation and does not present a market. Chile would absorb about 100 craft, but she has a really serious dollar shortage and would only grant import allowances of \$100,000 in 1946. Her government's attitude has been that lightplanes are a luxury item and do not warrant allotment of precious dollars. We are trying to sell her officials on the idea that the personal plane means transportation. We are having some difficulty, however, since the British and French are willing to take Chilean pesos and will extend long-term credits, which our people do not like. We still want cash on the barrel head in our own currency.

"The best solution seems to be for our manufacturers to lend planes on credit to local dealers, after a fixed down payment, and then allow them to finance their sales through the finance companies in their own countries. Unfortunately, these companies charge excessive interest rates.

"The French have recently established offices in both Santiago and Buenos Aires and are expected to put up a real fight for the market. They have government support behind them, which gives them the opportunity to offer extremely advantageous terms but they are only interested at present in selling military craft and commercial transports, as are the British. Both countries will do what is politically expedient, which we do not always consider in our business dealings."

This story is not new. The same situation existed before the war, when we were less concerned about an export market than we are now. If some method of long-term credit can be worked out with safety for the investment of our manufacturers, it would be to the advantage of everyone on both sides of the border. One other factor could be developed which would create a continuing market, as well as help towards better understanding. If the Latin-American Escadrille could be revived on a practical, non-political basis, it could become the focal point for much inter-Hemisphere flying. It had great possibilities as originally constituted, but allowed itself to become embroiled in political fights in the various countries, with the result that the State Department was embarrassed and forced to withdraw its support. As a purely personal pilot organization, interested in promoting aviation development on a Hemispheric scale, it could accomplish much good, both culturally and economically. We recommend this idea to the various governments and aviation organizations for their consideration.

J. FRED HENRY



Something New on the Nose of the New SUPER CRUISER

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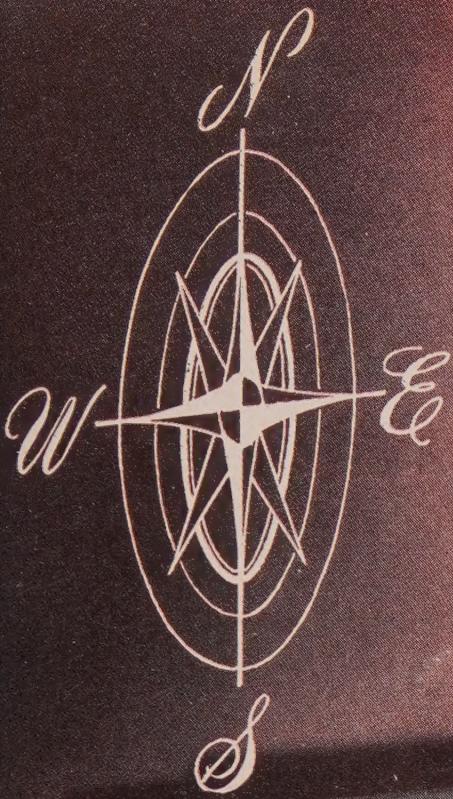
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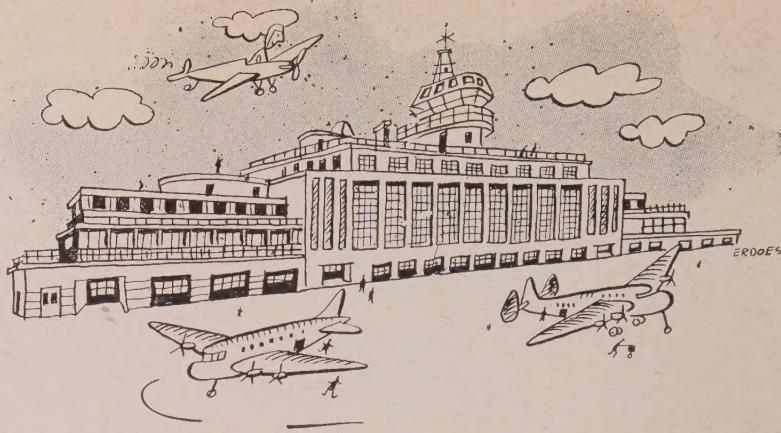
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WASHINGTON NEWS

BY ALICE ROGERS HAGER

BIGGEST news on the military front at the moment is the activation of National Guard Air Units, with Federal recognition already granted to 112. Georgia ranks first with 13 organized; California and Missouri total 11 each; Massachusetts, 8; Colorado, 6; Connecticut, District of Columbia, Iowa, Michigan and Oregon each have 5; Arkansas, Delaware, Kansas, Mississippi, Nebraska, Vermont and Wyoming 4 apiece; Idaho, Minn., S. Dak., 3; Maryland, 1.

A ceremony recently held at Andrews Field in Washington, at which General Carl Spaatz spoke, inaugurated the flight program for the nation. First tactical aircraft have been delivered, but there is still some difficulty in getting sufficient airports, especially in cities where civilian operators object to military flying on cramped municipal fields. However, the AAF expects to deliver 2,861 aircraft to the Guard by June, including P-47's, P-51's, AT-11's AT-6's, A-26's, C-47's and L-5's. Major General B. B. Miltonberger is Chief of the Nat'l. Guard Bureau.



New officers of the National Aviation Trades Association are Beverly Howard, Hawthorne Flying Service, president; Norman Larson, Pacific Aircraft Sales, 1st V.P.; F. Leslie Madsen, Buffalo Aeronautical Corp., 2nd V.P.; and Wilfrid N. Post, Lehigh Aircraft Co., Treasurer. NATA reports that many bills, vitally influencing aviation will be introduced in the 1947-1948 state legislative sessions and should be closely watched by citizens interested in air development. Only Kentucky, Louisiana, Mississippi and Virginia will have no regular sessions. Principal bills to watch for, most of them drawn after model legislation planned by authoritative national organizations, will concern: aviation commissions or departments, airports, intrastate air commerce regulation, gas and other user taxes, and such special subjects as liens, recordation of titles, insurance and aeronautical education. For detailed information regarding this, contact the National Aviation Trades Association, 1365 Connecticut Ave., or the National Aeronautic Association, 1025 Connecticut Ave., both in Washington, D. C.

A bulletin issued by War Assets Administration, 425 Second St., N.W., Washington, D. C., called "War Wings for Peace" tells of the disposal of several billions of dollars worth of surplus aircraft in the past two years and the many businesses that equipment has helped to start, including cargo, charter flying, crop dusting, repair and conversion. It includes extensive information as to ways of buying surplus aircraft parts and equipment.



Since so much will be heard about the fight for and against merger of the armed forces in the 80th Congress, a brief summary of what is asked by the President is important.

The Navy is still afraid of being "absorbed" and still doing all in its power to prevent the inevitable. The War Department has marshalled all its big guns and trained them on Capitol Hill for the offensive favor of the measure.

Here are the main points: a single Department of Common Defense, its civilian Secretary a member of the Cabinet, with the three equal branches, Army, Navy and Air (the Marine Corps stays in the Navy); a Council of Common Defense, consisting of the Secretary of State, Secretary of Common Defense, the three Service Secretaries (not Cabinet members) and the permanent civilian Chairman of a new National Security Resources Board (composed of representatives of the military services and other associated agencies); the Joint Chiefs of Staff, acting military advisers to the President and the Defense Secretary, who are responsible for strategic plans, integration of service budgets and military programs and strategic direction of military forces; a Central Intelligence Agency with another agency within the Defense Department, coordinating intelligence activities of the three services; the other agencies under the Department, coordinating and controlling procurement and supply, scientific research and development and review and integration of education and training of service personnel.

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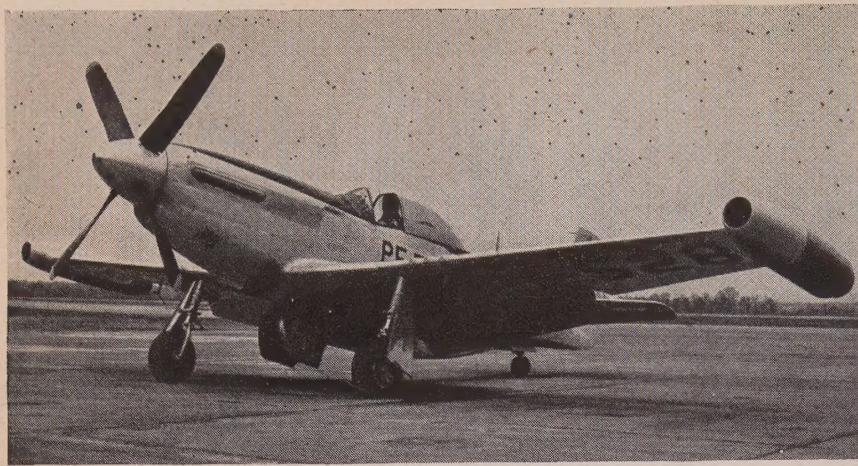
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RAMJET MUSTANG is special version of the P-51D used for flight-testing ramjets

MILITARY AVIATION

High Speed Ramjets

Next step in the evolution of jet power plants is to flight-test ramjets. These have already been tested in flight from the ground with rocket take-off, as in Navy's six-inch ramjet *Cobra*, which was a part of *Project Bumblebee*. The ramjet is a simple tube (properly shaped inside) into which air is rammed and compressed by the forward speed of the airplane or missile, and in which fuel is supplied, burned and forcibly exhausted. The ramjet requires a speed of about 350 mph to work at all, but is not really efficient until it gets to more than double that figure. At the speed of sound, or 760 mph at sea level (Mach 1.00), the compression ratio is about 1.8 to 1. Double the speed again (1,500 mph) and the compression ratio is slightly more than tripled (5.5 to 1), a gain in efficiency due entirely to speed. Aircraft are now being designed to fly at 1,500 mph or more with the ramjet engine, and in the meantime valuable data is being learned about its operation in the lower speed ranges in its tests on the wing-tips of a special P-51D (above). Flying at 350 mph with its *Merlin* engine, the ramjets are cut in, and speed can be advanced to more than 500 mph (low level Mach number .65), which is about as fast as this particular design can be safely pushed.

Rocket Convention

After a decade and a half of existence as an enthusiastic group of "mild crackpots," the American Rocket Society became affiliated with the 66-year-old American Society of Mechanical Engineers in December 1945. This step came largely as a result of the vast strides in rocketry and jet propulsion during World War II in ground and airborne armament and propulsive power for aircraft and missiles. This affiliation was a solid gain and (not that the boys really needed it) it gave the whole enterprise a higher professional standing. The next step came a year later when the Rocket Society held its first two-day national convention

in connection with the Sixty-seventh Annual Meeting of the ASME at the Hotel Pennsylvania, New York, during the first week of December. The papers, sessions and discussions were tied in with two of ASME's 19 divisions, Aviation and Oil & Gas Power. A further tie-in resulted from the fact that some of the leading jet propulsion engineers in the country are members of both societies and took an active part in the Rocket Society's meetings, as chairmen and recorders of sessions, leaders of discussion, etc. These included top men from such companies as General Electric, A. V. Roe Canada, Ltd., Reaction Motors (N.J.), Aerojet Engineering Corporation (Calif.), Wright Aeronautical and the Rocket Section of Curtiss-Wright Corporation. Officers from Army and Navy also gave illustrated lectures.

Supersonic Problems

In one of the sessions Colonel Reichert of Wright Field quoted General Craigie, Chief of Engineering Development: "With respect to many of the major problems confronting us today we stand about where the Wright brothers stood when they were contemplating their first flights some 40 years ago." This points up the fact that the problems of flight in the transonic and supersonic range will be different in kind and not merely in degree from those involved in flight from say 40 mph. to 640 mph. Col. Reichert feels that many of these problems are like "ghosts, because we have not been able to physically *feel* the sort of thing our slide rules and small-scale test data tell us." The problems include those of structures, aerodynamic shapes, control, propulsion installations, materials, armament, and escape provisions. Leading edges may be so sharp that aircraft manufacturers are contacting makers of razor blades! Wings and tail surfaces are swept back like the paper darts Junior makes with the Sports page right after dinner . . . Turbojets, ramjets, rockets and combinations of these power plants are all being used. Propulsive units at the wing tips are very promising on unswept wings,

but not with sweepback . . . Beyond the speed of sound the wind-tunnel tests warn of severe control reversals so that the pilot may have to *pull* on the stick to get the nose down and *push* to get it up . . . Main problem on materials is that of extreme heat resistant requirements in materials for turbines, compressor blades, combustion chambers and rocket jets. Ceramic coating (pottery and glazing techniques) and internal cooling devices are expected to offer a partial solution . . . The problem of escape is one of the biggest headaches of all, with a capsule that can be separated from the airplane at any speed or altitude and carry the crew members to safe level as the best bet. Buck Rogers, take it away!

Navy Jets

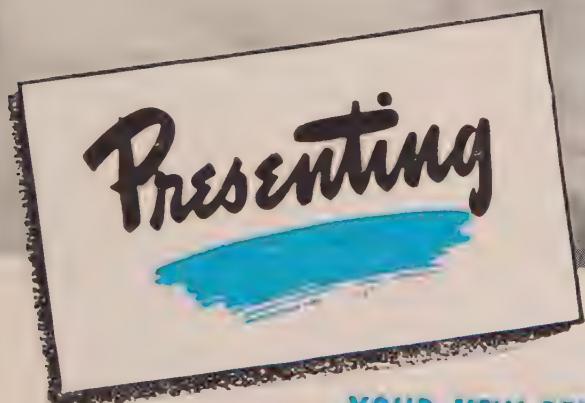
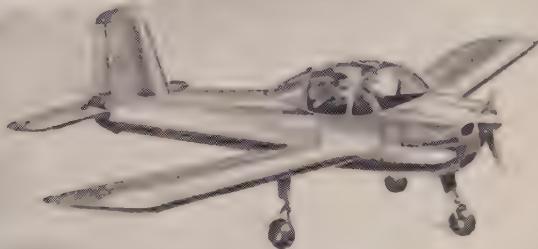
The Navy may have been a little slow in getting their jet aircraft program going, but the stuff is now really beginning to roll. The 1945 Ryan FR-1 *Fireball*, with reciprocating engine and propeller in nose and jet booster in the tail was only a start. The advanced version, Ryan XF2R-1 with General Electric TG-100 turboprop in the nose and I-16 turbojet in the tail has been test flown. Another "composite" job is the new Martin XP4M-1 patrol bomber, with two *Wasp Majors* (3,000 hp each) and two Allison-built I-40-4 turbojets. Still another is the Grumman XTB3F-1 carrier-based torpedo bomber, with P & W *Double Wasp* "C" engine (2,100 hp) and Westinghouse 24C turbojet (2,700 pounds of static thrust) in the tail. A Grumman jet fighter, successor to the F6F *Hellcat* and F8F *Bearcat* is also in the works. Other "pure" jet fighters include the North American XFJ-1 (with GE's TG-180) and the Chance Vought XF6U-1 with the 24C. These have been test flown, and the earlier McDonnell FD-1 *Phantom* (two Westinghouse 19XB-2B's of about 1,400 pounds of thrust) has also been the subject of extensive carrier-test operations. McDonnell's advanced XF2D-1 should be ready within the next few months.

After XS-1—what?

The XS jobs are now supposed to run to nearly a dozen. Not much is known about them. The XS-2 is also being built by Bell, and will be of stainless steel rather than aluminum, with sweptback wings to delay the effect of compressibility. Sponsored by Navy, the XS-3 is being built by Douglas, and is reported to embody a highly streamlined diamond-shaped supersonic wing, with all stops pulled out in the matter of composite power plant—turbojets, ramjets and rockets. Northrop is developing the XS-4, a delta-shaped flying wing design. The XS-3 and XS-4 are to be flown with more powerful rocket engines than the Reaction Motors 6000C4 in the Bell XS-1. Other companies working on experimental piloted supersonic aircraft to be powered by rockets, ramjets and/or resojects include Boeing, Curtiss, Convair, Edo, Lockheed, Martin, McDonnell, North American and Republic—in other words, all of them.

Engineers of some of these companies (while not discussing details of any particular project) have talked quite freely in terms of 2,500 mph speeds as possible within the next few years. This is all right if you just say it casually, but it actually is a speed of over 40 miles a minute!

N.F.S.



YOUR NEW PERSONAL PLANE...THE THORP SKY SKOOTER

combines **Outstanding Performance** with **Low Price** in a modern, all-metal, two place personal airplane . . . Features effortless flying • extremely short take-off and landing • 400 mile range • 100 plus cruising speed — minimum maintenance . . . An achievement in light aircraft engineering.

THORP AIRCRAFT COMPANY

8000 WOODLEY AVENUE



VAN NUYS
CALIFORNIA



AIR YOUR VIEWS

New Shoes for Daddy

Gentlemen:

I have followed gripes, articles, letters to editors and the like in various aeronautical publications for some time. As a private-plane owner, I would like to make a suggestion for the small-field operator. Why not install a cement walk and small ramp so that on landing you and your family will not have to wade through a lot of mud before arriving at the administration building? My Sunday shoes are a wreck and will remain so if I don't stick to major airports.

W. H. ROWELL

Edwardsville, Illinois

"Hot" or "Strange?"

Dear Editor:

There are several words and phrases often used and misused in aviation. Out of the list including depth-perception, coordination, air pockets, and "hot," the last-mentioned is at present most misused. Why don't we stop talking about "hot" airplanes? In most cases "different" could be substituted, or, better still "strange."

A P-80 pilot doesn't crack up a *Cub* because the *Cub* is a "hot" airplane, but because the *Cub* is strange to him, and possibly because he's too smart to need a check out. By the same token, the *Cub* pilot doesn't crack up a P-51 because the P-51 is a "hot" airplane but because he has made too big a jump in hp or speed without a recent and proper check-out in an AT-6.

The same substitutes of the word "hot" may be made as applied to pilots. Some of these self-styled hot pilots are indeed "strange."

I learned on T-crafts, became a "hot pilot" in the RAF (*Spitfires*, actually), cooled off on P-51's and am now a frozen crop duster.

MASON L. ARMSTRONG
Daytona Beach, Florida

We'll add a hearty Amen to that!—ED.

Aviation Training

Dear Sir:

I am an Aviation Radioman in the U. S. Navy. I could continue in my field by staying in the Navy as a Radioman, but I want to learn more about aviation and aircraft than just how to operate and maintain radio equipment. In other words, I would like to become an aeronautical engineer. I know I can do this under the G. I. Bill of Rights by going to college. However, I was wondering if some of the aircraft companies have apprenticeship courses to teach in a practical way.

JOHN JOSEPH YOUNG

U. S. Navy

We suggest you write to Northrop Aircraft, Inc., Northrop Field, Hawthorne, California, for information on this subject.—ED.

Flag Position

Gentlemen:

I would like to inform you that your December cover page displays the American Flag with the blue field and stars in the wrong corner of the flag. It is quite an eyesore if you'll notice.

C. J. LENHOFF

Wilmington, Delaware

The original drawing, C.J., caused a small controversy in the editorial offices of SKYWAYS. So we trotted down to the Army for official ruling. The position is correct as it appears.—ED.

Carrier Designed

Dear Sirs:

The inside cover of your October issue of SKYWAYS (McDonnell ad) shows a McDonnell jet aircraft on a U. S. carrier. The caption states that it was the first jet-propelled aircraft ever to take off and land from a carrier. Did not a Royal Navy *Vampire* jet fighter take off and land on a British carrier before this?

G. P. H. RICHARDS

Winnipeg, Manitoba

You were tripped up by the wording. The caption stated "first . . . jet-propelled plane specifically designed for carrier use . . ."—that "specifically designed" is the catch.—ED.

On 'Copter Training

Gentlemen:

I was especially interested in your article "Magic Carpet Pilot" in the November issue. I am anxious to obtain information on Bell Aircraft's helicopter pilot's training school regarding possibilities of enrollment in that course, entrance requirements, etc.

ROBERT W. KEMPER

Drake, North Dakota

The course covers from four to six weeks, with a maximum of 30 hours of flying time. Eligibility for admission is limited to 1) Purchasers of helicopters who intend to fly their own ships, 2) Pilots selected by Bell helicopter owners, and 3) Carefully chosen personnel (holding CAA commercial licenses) of outstanding ability, selected by Bell.—ED.

Slight Confusion

Dear Editor:

In your December issue of SKYWAYS I was very interested in the story "Waterway Airports." In this article Bob Fogg was quoted as saying there was a seaplane base in Clarksburg, West Virginia, in the shadow of a tall office building. I am wondering if he meant the Kanawha Fly-

ing School, started by Glenn Clark in 1931 behind a 15-story office building in Charleston.

A. E. FRANCE

Charleston, West Virginia

You're right—Major Fogg was misquoted. The base he was referring to is the one operated by Clark in Charleston.—ED.

From the Distaff Side

Gentlemen:

"Pride and Prejudice" might be the title of a famous novel, but to me it sums up pretty neatly what women have to put up with in aviation. Whatever gave men the idea that flying was a "For Men Only" project? Typical of the sort of thing women students and pilots put up with is this sad little tale: Not long ago a very plane-happy gal spied an ad which bemoaned the lack of flying club members, and (supposedly) welcomed all applications. Hastening to the nearest phone, the girl called the president of the club and eagerly requested further details. She had barely finished speaking when the voice at the other end of the wire interrupted with "Sorry, no girls are admitted into the club." A sharp click indicated the conversation was at an end.

When you boil it all down, the two really basic requirements for a pilot are average intelligence and a desire to fly. Now, where is the need for sex discrimination? Why can't men stop acting like spoiled brats selfishly hoarding a precious toy—there's plenty of room in the wild blue yonder, and we gals like to fly too!

TERRY McCALL

Maple Shade, New Jersey

One Man's Effort

Dear Sirs:

The article "Light Plane Engines Today and Tomorrow" (December SKYWAYS) is most interesting. However, I feel that the author erred when he stated that the use of jet propulsion for lightplanes was dependent upon the attainment of 300 or 400 mph.

It is my opinion that in the not too distant future, privately owned lightplanes will efficiently utilize jet-propelled propellers at conventional airplane speeds. If they don't, it will not be because I have not made a serious effort.

HARLOW B. GROW

Linden, Missouri

You are quite correct in your opinion that before too long privately owned airplanes in the 150-200 mph bracket may be efficiently using not "jet-propelled propellers" but gas-turbine propellers. That is, instead of a piston engine to turn the prop, a lightweight gas turbine will do the job. This is known as a turboprop, as distinct from a turbojet which is propelled by reaction from exhaust gases alone.—ED.

A Matter of Fact . . .

Gentlemen:

After living five years in Mexico and knowing this country almost better than my own, I am grieved to read the following item in "Air Tour of the South" in the November issue: "The greatest item of expense in this journey . . . (was) the motor journey from Merida to the Chichen Itza ruins."

Even for Spanish-speaking persons it is sometimes difficult to get accurate information in Mexico. On my many travels through Mexico, I have had reputable travel agents swear up and down that there were no bus services to such or such a town, only to discover them for myself at a later time.

Getting back to the above statement, Yucatan has very reliable travel service and information. Merida's Chamber of Commerce puts out a map, and on the back is listed a schedule of bus services from Merida to Uxmal and Chichen Itza. Even as far back as 1948, when I first visited Yucatan, these schedules were in force just as they are today. I have gone to all of these places by bus. It was the cheapest part of my trip.

AIDA THOMPSON

New Orleans, Louisiana

We stand corrected, Miss Thompson, and thank you for bringing it to our attention.—ED.



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When an Aeromatic* Propeller Gives You More Get-Up-and-Go!



TAKE-OFF: With engine at full throttle, Aeromatic Propeller assumes low pitch automatically . . . gets plane off ground quickly, allows use of full take-off power.



CLIMBING: Aeromatic responds to natural forces . . . increases pitch automatically as air speed increases . . . gets plane to cruising level fast . . . on minimum fuel.



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For tops in flying enjoyment, there's nothing like an Aeromatic on your private plane!

IT'S COMPLETELY AUTOMATIC! The Aeromatic Propeller is the *only* completely self-acting and self-contained propeller . . . varies its own pitch automatically for peak performance all the way. There are no extra controls to fuss with . . . no extra instruments to watch.

PUTS MORE PEP IN YOUR PLANE! One-fourth shorter take-off run! One-third higher rate of climb! Greater cruising range and speed! All with less fuel consumption, less engine wear! That's what you get from Aeromatic—"the propeller with a brain."

WRITE FOR INFORMATION! If you own a new plane or plan to buy one, enjoy the extra advantages of an Aeromatic Propeller. Write to your aircraft manufacturer or distributor and see if you can have an Aeromatic on your plane. Or drop us a line for free Aeromatic booklet. Koppers Co., Inc., Aeromatic Propeller Dept., 273 Scott St., Baltimore 3, Md.

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They are available now for most new private planes and are being installed on other makes and models.

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Aero **matic**

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TWO STARS strike a pose . . . the comely miss is actress Phyllis Ryder, former WASP, touring in stage play. "The Voice of the Turtle." And the comely plane? The Bonanza!

HANGAR FLYING

Signs of the Times

CAMDEN, NEW JERSEY—Frank T. Cashman of the Helicopter Air Transport, Inc. (HAT) on Camden's Central Airport recently held a meeting to which representatives of Civil Aeronautics Board and Civil Aeronautics Administration members were invited for the purpose of establishing rules and regulations for helicopters.

For the Bookworm

NEW YORK, NEW YORK—McGraw-Hill publishing company announces the *Casey Jones Encyclopedia of Aviation Terms*, compiled and arranged by Henry Lionel Williams. \$4.75.

An excellent book, contains simple-worded definitions of all aeronautical terms in common use today. An index lists every item defined, too. Illustrations are on every right-hand page, definitions on the left—in large type lettering. A truly fine source book—recommended for you and you and you.

Success Story

WILMINGTON, DELAWARE—A second twin-engine Lockheed *Lodestar* plane has been purchased by Hercules Powder Company because that company's experience with the first plane (owned over two years to date) has emphasized the value of this method of transportation in their business.

William P. Hobson, copilot of the first *Lodestar*, will pilot one of the "C-60's" and this only goes to show that the nation's airlines are not the only employers of pilots who want a niche for getting "big engine" time.

122.5 mc and 122.1 mc

WASHINGTON, D. C.—FCC has announced permanent allocations of new VHF in the 122-mc band for private aircraft. Since January 1, 1947, the CAA has been guarding the new frequencies which have been assigned for initial use for air-to-ground transmission—122.5 mc has been assigned to airport control towers and 122.1 mc assigned to CAA communications stations.

New Terminology

MONTREAL, CANADA—The Permanent International Civil Aviation Organization (PICAO) has recommended the use of the word "visual" to replace "contact," because there is no translation for contact in some languages. Instead of CFR (Contact Flight Rules) we would have VFR (Visual Flight Rules). Civil Aeronautics Board (CAB for short) in Washington, D.C. may adopt this recommendation.

Hats Off!

CLEVELAND, OHIO—Cleveland's downtown lake-front 2,500-foot air strip is almost ready for full-time operation.

First landings were made last November—several new personal planes around for demonstration purposes at that time (the National Aircraft Show was in full progress) plunked down on the 1,500-feet available then. Purpose: to fly courier between the downtown business district and the bomber plant where the Show was held (45 minutes out by cab—7 minutes by plane).

As it stands, northern Ohio towns—with airports daisy-chain their communities to Cleveland as straight as the crow flies.

It Can Be Done

HONOLULU, HAWAII—Picture landscaped grounds, complete with large lawns and palm trees, a one-story "hut" and a \$27,000,000 airport investment (courtesy U. S. Government) and you have the setting of this "anything-can-happen" story.

Add to this setting a group of disconsolate gal flyers and flyers-to-be who don't want to pay the high flight-rates demanded by the local flying schools for instruction.

Put the above two ideas together . . . and then go way out on a limb by adding the 10-year lease which the gals had on the airport facilities (at the rate of \$150 per year). It presents a concoction (airport facilities plus lease on those facilities plus girl's flying club *minus* flight instruction) that doesn't make sense. However, it finally all came out all right.

The manager of one of the flying schools felt sympathetic toward the group of girl-flyers-with-a-home-but-no-flying, and he offered them flight instruction at a rate more in tune with gals' pocketbooks. When the young ladies accepted, he put frosting on the cake by even sending his own carpenter over to help the gals fix up their "hut."

Today, the Honolulu girl flyers have their own clubhouse, flight instruction and a 15-weeks ground school. All approved by and under the auspices of the Department of Public Instruction in Honolulu.

Can You Top This?

Five dollars will be paid readers sending in pilot tales reprinted herein. Send to: Editor *Skyways*, 444 Madison Avenue, New York.

ST. LOUIS, MISSOURI—The moral for instructors in the following yarn is "never ask questions until you are spoken to!"

With great difficulty the student taxied up to the take-off spot and pulled into position. As he squared his ex-military trainer away, the instructor noticed the student had forgotten to lock his tail wheel. "Jones," the instructor asked, "have you forgotten to lock something?" Jones thought a while and then nodded approval. He then locked the controls and student and instructor were half way down the runway before the instructor could get them unlocked.—Submitted by Bob Manheim.

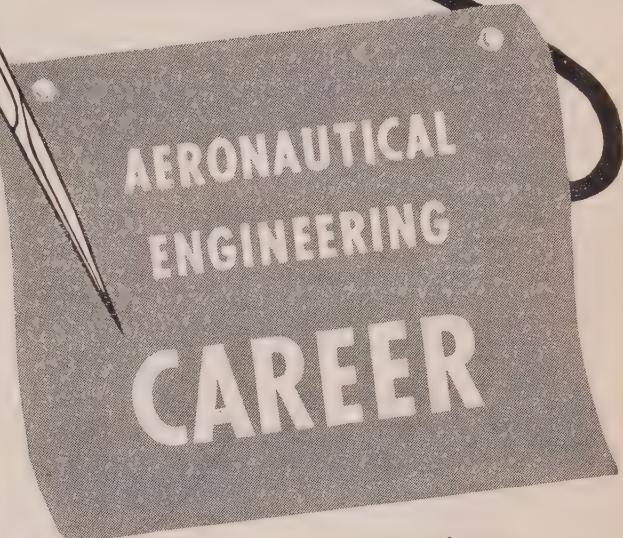
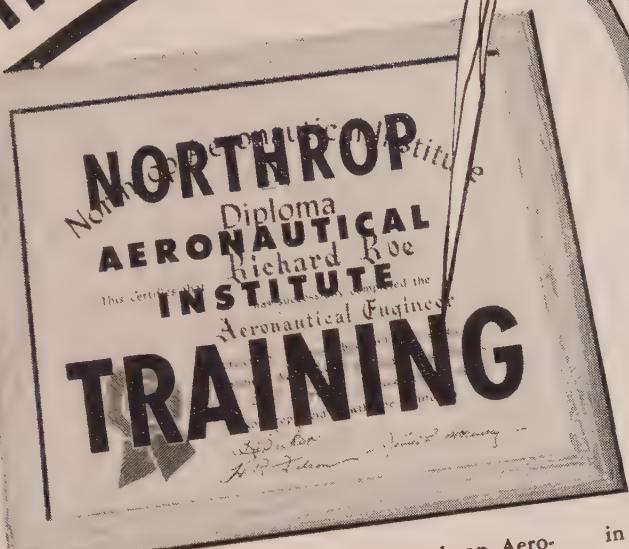
. . . Or This?

LOCK HAVEN, PENNSYLVANIA—The story around Cub Haven is that Fred Maytag of washing machine fame was flying back to Newton, Iowa, in his own ship when heavy rains forced him down.

Landing in a field he stood under a tree until the rain stopped. Surprised that no one was curious enough to come out and see what the landing was all about, he went over to a nearby farmhouse. A surprised woman opened the door with, "Oh, I thought it was my husband. He flies, and went to town a while ago . . . I thought he was coming back right away. But I couldn't figure what he was doing standing under that tree instead of coming into the house!"

THIS ONE STEP

IS ALL YOU TAKE



The engineering courses offered by Northrop Aeronautical Institute are complete and final preparation for an aeronautical engineering and final preparation necessary to continue beyond the maximum 2-year period of study. It is not necessary to spend a period of apprenticeship in the aviation industry. The Northrop graduate is fully qualified to enter the employ of an aircraft manufacturer or airline and take up actual engineering assignments.

Northrop Aeronautical Institute training concentrates solely on subjects directly related to aeronautical engineering. In the 2-year course there are actually more engineering subject hours than available

in 5 years of a collegiate curriculum. All subjects — even the basic sciences and mathematics — are taught in the form of practical application to aeronautical engineering work. Through practical assignments and projects the student learns and applies actual industry methods.

All of these advantages—for the student during his training, for the graduate in starting his career—are the natural results of training in this technical institute conducted by a major aircraft manufacturer, itself a leading employer of aeronautical engineers. The next classes start March 24th and May 19th. Enrollment is limited—early inquiry is advised.

APPROVED FOR THE TRAINING OF VETERANS UNDER THE G.I. BILL OF RIGHTS

The logo for the Northrop Corporation is centered on the page. It consists of a stylized aircraft in flight, rendered in a dark, angular style, positioned above the company name. The name is written in a bold, sans-serif font, with 'NORTHROP' in a larger, bolder font below 'DEDICATED TO THE' and 'ADVANCEMENT AND'.

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RADAR SCREEN (top, far left) shows location of typhoon, 39 miles away, 077 degrees T
HOUR LATER, radar screen (above center) shows typhoon 40 miles away, 055 degrees T
THREE HOURS later, typhoon is beyond range of radar. Note precipitation pattern
DESPITE RADAR warning which saved many planes, severe hurricane destroyed hangars



WEATHER BY RADAR

War-proved radar goes to work as weatherman, is seen as an aid to civil aviation

By HOWARD T. ENNIS

BASED on war experience, radar has recently come smack into the picture as a valuable aid in storm detection and general weather forecasting. Most of the work is being done at present by the Navy and Army Air Forces, but this is being fitted into a pattern whereby the information will become a distinct ally in the all-out drive for all-weather flying. The Weather Bureau, Army, Navy and National Advisory Committee for Aeronautics are conducting a research project on thunderstorm microstructure near Orlando (Fla.). Radar is used for detection, mapping, and surveillance of thunderstorm rain cores, and for taking some of the "rawin" (radio wind) observations.

It has long been known that cloud and precipitation areas give echoes different from those returned by solid bodies. At first this fact aroused only informal comment among radar operators, but with the collection of additional data a more complete study got under way. The oscilloscope of a radar set thus became a weatherman's crystal ball, admittedly somewhat by accident.

Radar, working for the Army Air Forces, has detected hurricanes and typhoons within a 200-mile radius, and with equal ease picked up advance notice of local thundershowers. This is enough for the present. (Another electronic method of storm detection called "sferics" [contraction of "atmospheric electricity"] has a range of more than 2,000 miles, though it lacks radar's refinement).

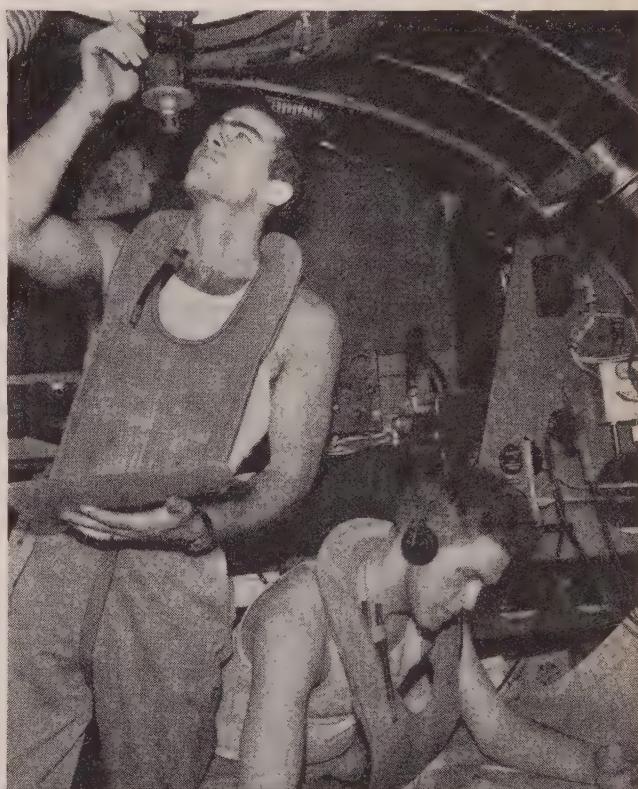
The Florida hurricane of September, 1945, was discovered 20 hours before it hit the mainland. Its every move and rotation was observed on a super-radar screen, laid out to resemble a compass, which had been installed at the Air Force center at Orlando. Vivid white echoes indicated a storm of hurricane proportions, and also revealed the con-

tour of the storm, its directional speed and intensity.

Weather affects radar in three important respects: (1) as *creator* of echoes on radar scopes, (2) as *modifier* of normal radar carrier paths with resultant abnormal propagation, and (3) as an *obstacle* to return of echoes.

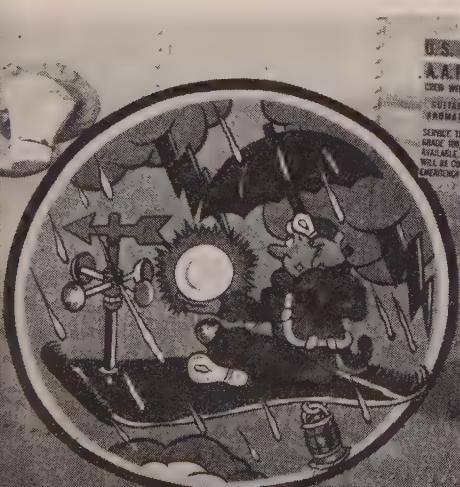
The commonly accepted theory is that a meteorological echo is caused by the reflection of the radar pulse from the moisture particles in the atmosphere. This reflected (Continued on page 50)

HURRICANE HUNTERS, contrary to what one might expect, are not constantly bouncing around in high winds and rain, nor is work carried on under high tension



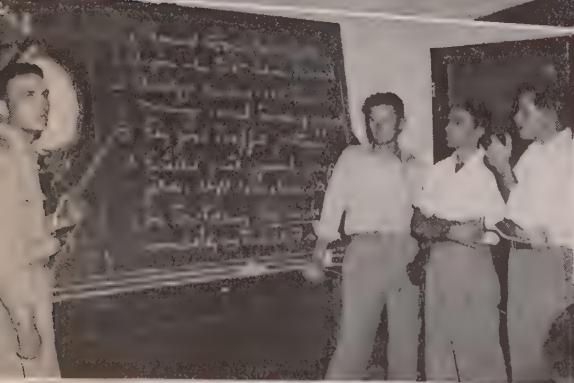
RADAR operators aboard plane on "hurricane patrol" hunt a storm for meteorological studies by the AAF

EMBLEM of Hurricane Squadron—vane, crystal ball, etc.—is said to make flying carpet a safe place





LIKE OLD TIMES, Lt. Mead Knight (above left), Lt. R. Irwin (center) get a ship briefing from Major Keene before they take plane up for hop. Correct procedure is "brush-up" topic (left), too. All Reservists, like Maj. Keene (below left), are AAF vets of World War II



Air Reserve Program Takes Shape

Almost a year old, AAF Reserve Program is definitely helping to rebuild our AAF team

“**A**AF Air Reserve” was an idea and a plan a year ago. Eight months ago, it saw its first pilot again take to the sky in a training plane. Today, it has over 31,000 officers and men enrolled at 63 bases, and more coming in daily. About 27,000 of these are pilots. When it is up to full authorized strength, it will include 27,500 non-rated officers (administrative and service) and 120,000 enlisted men and—added to the Air Forces of the Regular Army and the Air National Guard—will at last give the United States the right to translate its initials into a new slogan: “The Army Air Forces Are Ready.”

Because interest among former members of the AAF is mounting so rapidly, since the headaches and delays of the first year of organization are almost over, it is a good time to take stock of what has been accomplished and a look at what is ahead. There are thousands of men scattered over the country who would join tomorrow if they realized the advantages offered them. The current economy drive on the part of Congress makes it imperative for the country that our defense-es-

lishment-in-being should be supplemented by strong reserve forces whose training has been kept up to date, both in skill and in knowledge of new weapons. The highly technical skills needed by the AAF mean that these reservists need constant refresher experience and instruction in the increasingly complicated plane types being developed.

That's the national reason for the importance of the Reserve. From the standpoint of the men themselves, there are a lot of dividends to be had in taking this training. If Congress can be persuaded to pass the pay Bill—and the Army and the various Reserve Associations are all backing it—then the man who enrolls will get his training plus money for his time invested. Members of the Air National Guard are paid for their training time but they are subject to much more rigid rules. They must give so many hours a week plus a yearly encampment and they can only miss duty assignments twice without being dropped. They are subject to call in any national emergency, including disasters such as forest fires, earthquakes, floods or even strikes. (Continued on page 52)

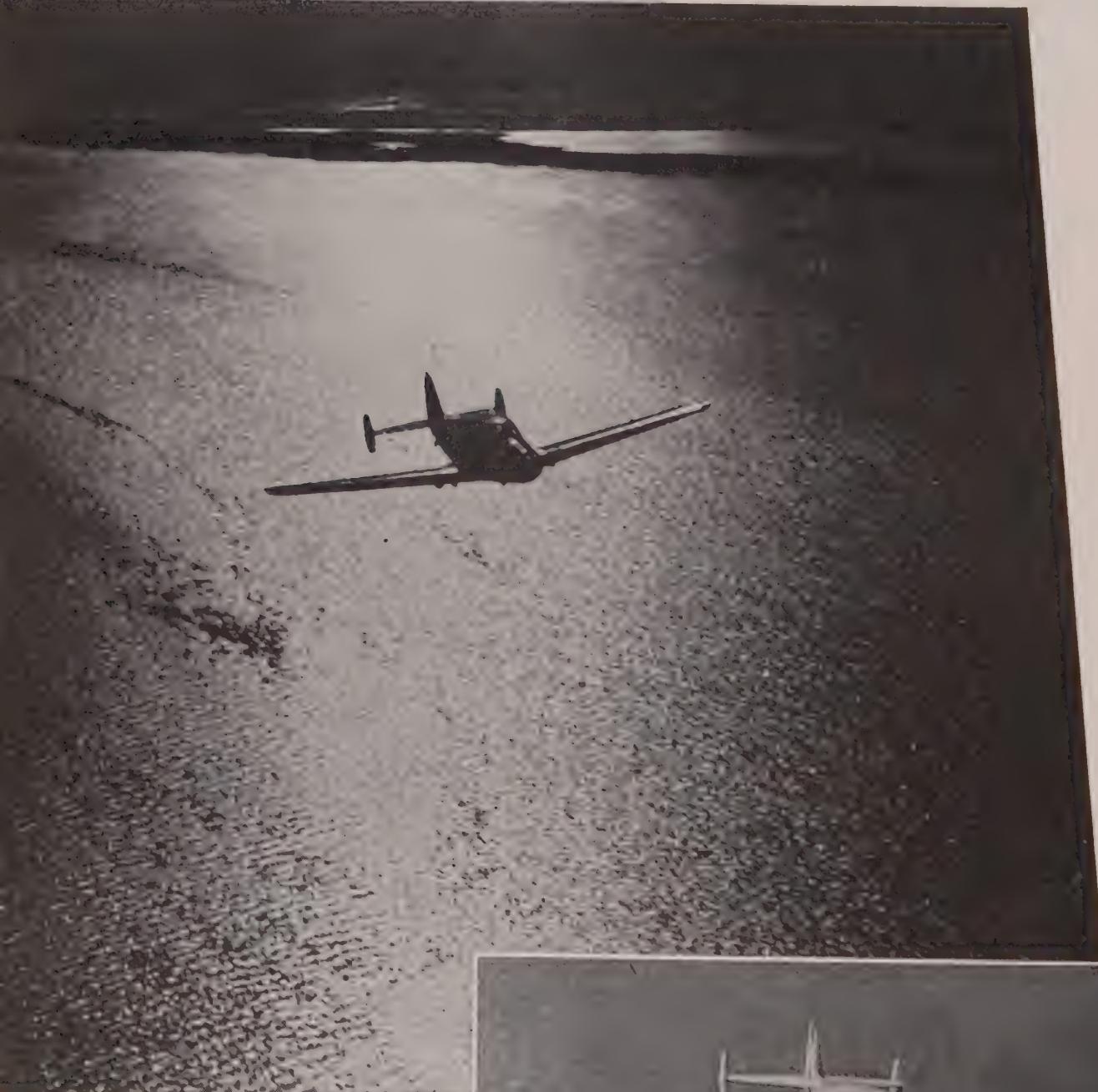
By ALICE ROGERS HAGER

AAF RESERVISTS go through ground school refreshers and plenty of AT-6 solo time before they are “graduated” to such big stuff as P-51's. Here Capt. Wiens (right) gives Capt. Leroy Dickson a P-51 cockpit check. Dickson now is gov't employee, flies on weekends



PLANE REPORT . . .

FOUR-PLACE *Cruisair Senior* is one of today's fastest personal planes. In cruising, pilots can obtain an indicated 150 mph from 2,400 rpm



FROM 20-gallon right and left fuel tanks, 150-hp engine draws and metes out a range of 650 miles (time aloft—4 hours 30 minutes)



BELLANCA CRUISAIR SENIOR

IN 1911 at Mineola Field, Long Island, with the then "tall" skyscrapers of New York City in the background—a short, slim young man who had never flown before stepped into an airplane which had never been flown. To the amazement of the few spectators who had gathered at the site, he took off. The man was Giuseppe Mario Bellanca. The plane was the first successful Bellanca, a high-wing, parasol monoplane which he had designed and built with the aid of his father and brothers in the basement of their Brooklyn home.

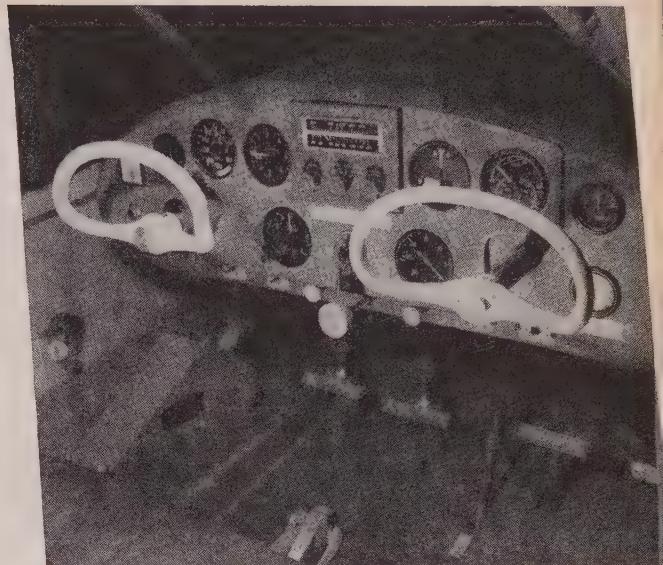
Today there is another successful Bellanca (there have been many since 1911) which the president of Bellanca Aircraft Corp. of New Castle, Delaware, designed and caused to be built in a modern hangar-type factory. The president is the same Giuseppe Mario Bellanca. Today, when New York City skyscrapers are in the background, taller and more profuse in number—or if instead of skyscrapers the background is the wide sweep of the Illinois prairie—the 1946-1947 Bellanca that wings overhead is a sleeker, faster, more streamlined Bellanca than any so far. This Bellanca, the *Cruisair Senior*, is a four-place, low-wing cabin monoplane powered by a six-cylinder 150-hp Franklin engine.

It is offered to the plane owner in a series of models, ranging from A, B, C and D through E. *Cruisair Senior* Model A has a soundproofed cabin, a fixed-pitch prop (Sensenich), manually retract-

(Continued on page 46)

By GENE LANDMAN

DICK HART, pilot and buyer for a retail furniture concern, flies company buyers on business trips to their factories



FULL PANEL (above) is in Model D. Note manual gear actuator center of seat. Gear (below) in down position

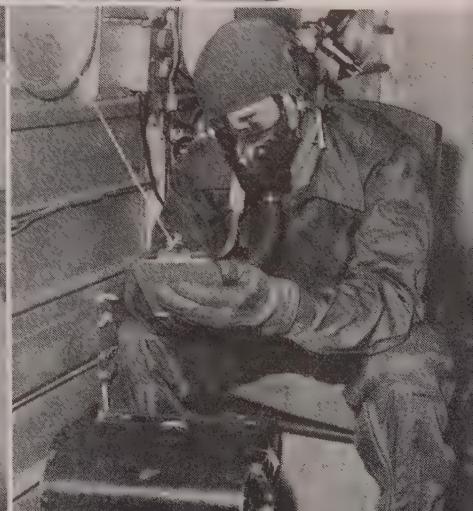


Sky Shutterbugs

By BOB ARENTZ



AERIAL MAPPING TEAM. Rodriguez brothers operate from an AT-11. Using camera with 8 1/4-inch lens, boys shoot the pictures from altitude of 14,000 feet and up



**If you're looking for a job
in aviation and know how to
fly, consider aerial mapping**

LOOKING over a list of the high-paid flying jobs offered today there might be one or two things show up to discourage even the newcomer who is a "natural" endowed with superior skill . . . the jobs either being fraught with risk and a high fatality rate, like crop dusting, or testing new equipment—which promises to be a short happy life in the sonic speed range. The good jobs —i.e. first whack at the four-engined airline berths —come to the greying veteran who has spent 20 years getting seniority.

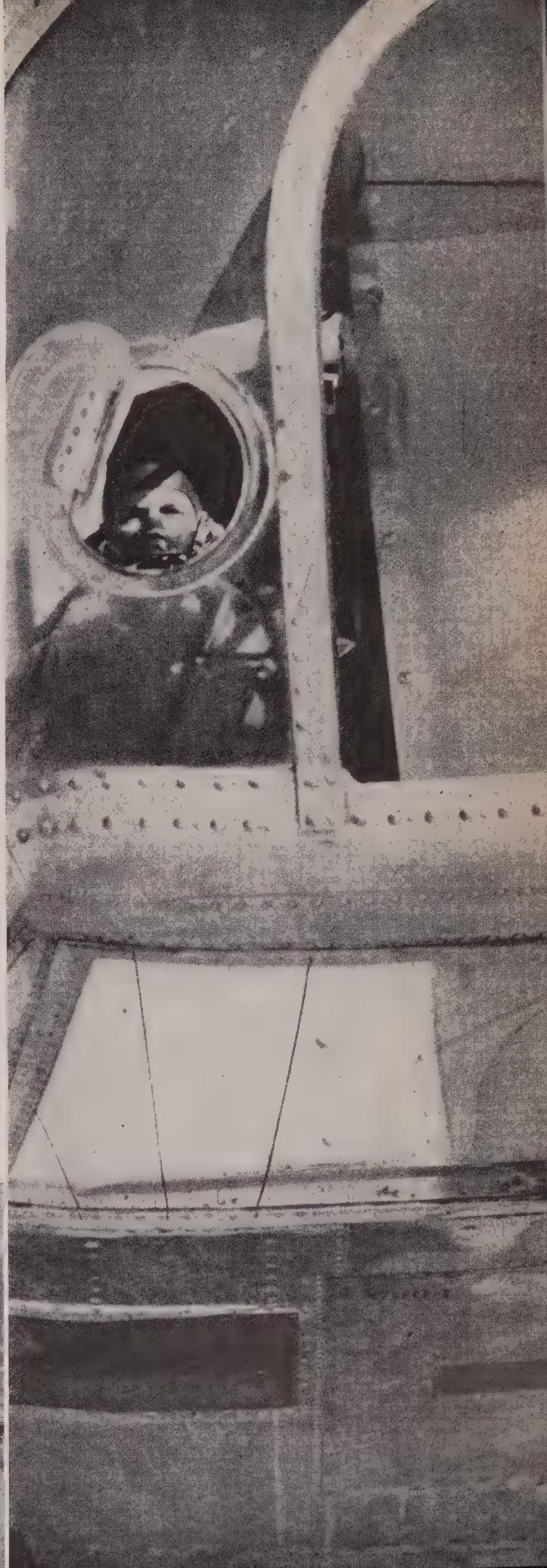
In evaluating most flying jobs today, an outstanding degree of skill is no particular advantage, being offset by the dangers on one hand and subjected to the winnowing of years on the other.

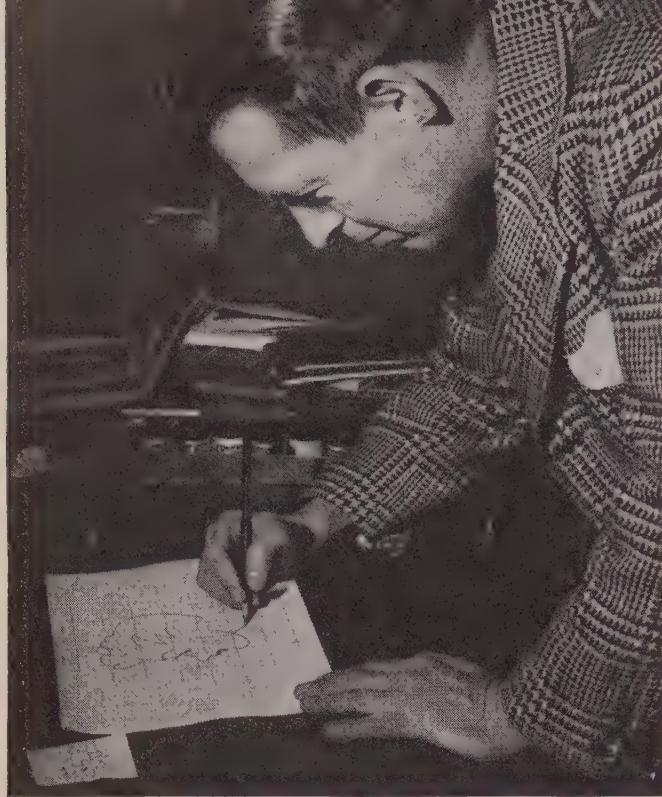
But there's one flying job that pays a premium on flying skill and at the same time reveals the best safety record of all types of commercial flying during the past 20 years. That one is aerial photo mapping. They don't care if you are 60 plus and grey of hair, or 20 minus, smooth of cheek. If you can turn in a perfect map and get along with your partner so that he turns in perfect negatives . . . brother, aerial mapping is one of the best games open today.

The pilot who really makes good is the one who knows the cameraman's problem. (Most of these pilots started by pushing the shutters and wound up pushing the throttle.) But a cameraman who doesn't miss, plus a pilot who doesn't drift, is a rare combination.

To make a grand a month at this business, however, you need the latest in equipment besides the absolute zenith of teamwork between pilot and cameraman. The business (Continued on page 54)

PILOT VISIBILITY being a "must" Joe Rodriguez flies from right side of AT-11 while brother Homer hovers over camera. Note oxygen mask he is wearing, above.





Operation REMBRANDT

By C. B. COLBY

FIRST STEP, as demonstrated by the author, is to transfer drawing from a small sheet to one of "actual" size

SKETCH is then transferred to the plane (second step). To do this back of the drawing is rubbed with charcoal



Any plane owner . . . with little time, expense . . . can paint a neat insignia

SHORTLY after American aircraft began to arrive in England during the war, considerable consternation was caused by the gals that flew in with them. I don't mean flesh-and-blood females that rode in the cockpits with the boys, but paint-and-lacquer lassies that reclined invitingly along the fuselages and over the noses of the B-24's, B-17's and lesser fry of the AAF.

No mean talent was shown by the unnamed artists but attention to detail was the watchword, so much so in fact that our "brass" in several instances requested prompt application of paint and less accurate memories or vivid imaginations. I remember a B-24 with a gal named "Solid Comfort" on its nose up in Goose Bay that looked as if Kilroy HAD been there.

This mania to decorate aircraft still is with us and many a personal plane carries in miniature those well-upholstered versions of what comedian Joe E. Brown calls "those soft things that talk," —along with names, slogans and insignia.

The part that annoys me, as an old art school "grad," is the sloppy way in which most of these decorations are applied. I'm not "agin" decorations and gals sprawled over your J-3's and Ercoupes, you understand, but let's have the lettering straight, and the gals "sharp" and "well stacked up" as my nephew in the AAF would say. Perhaps I can give you a few pointers.

Let's take those conservative chaps who merely want some lettering: their name, their gal's name, or perhaps a nickname on the ship. A few simple rules will make all the difference in the result and instead of a sloppy, uneven and "hammy" affair, you'll have a crisp professional lettering job.

You've never lettered in your life? Think nothing of it. If you can print (*Continued on page 58*)

DRAWING is then placed against fuselage, in this case near the cowling, and fastened down with scotch tape



FINISHED JOB not only looks good but is permanent



SIXTH STEP, after the paint has dried, calls for dusting the art work to remove all excess charcoal, chalk



FOURTH STEP finds author-artist Colby tracing over his drawing with a pencil. The charcoaled back will leave an imprint on the fuselage which Colby next fills in with paint (above). A steady hand is called for here



British versus American . . .



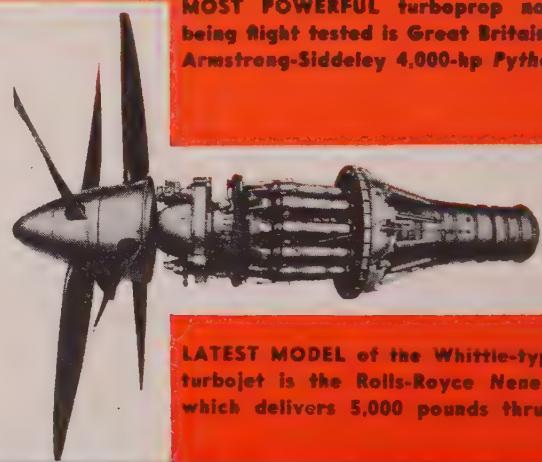
AIR COMMODORE Whittle, RAF, receives Guggenheim Medals from CAA's T. P. Wright; Air C/M Garrod at right

THE British have hitched their wagon to the gas turbine star and are confident that it will draw them into air leadership within the 1950-60 decade. This is not the opinion of any one man or specialized group, but is based on repeated statements of the government and industry planners, including leaders of the Royal Air Force, the Royal Aircraft Establishment, the Ministry of Civil Aviation, the Society of British Aircraft Constructors,

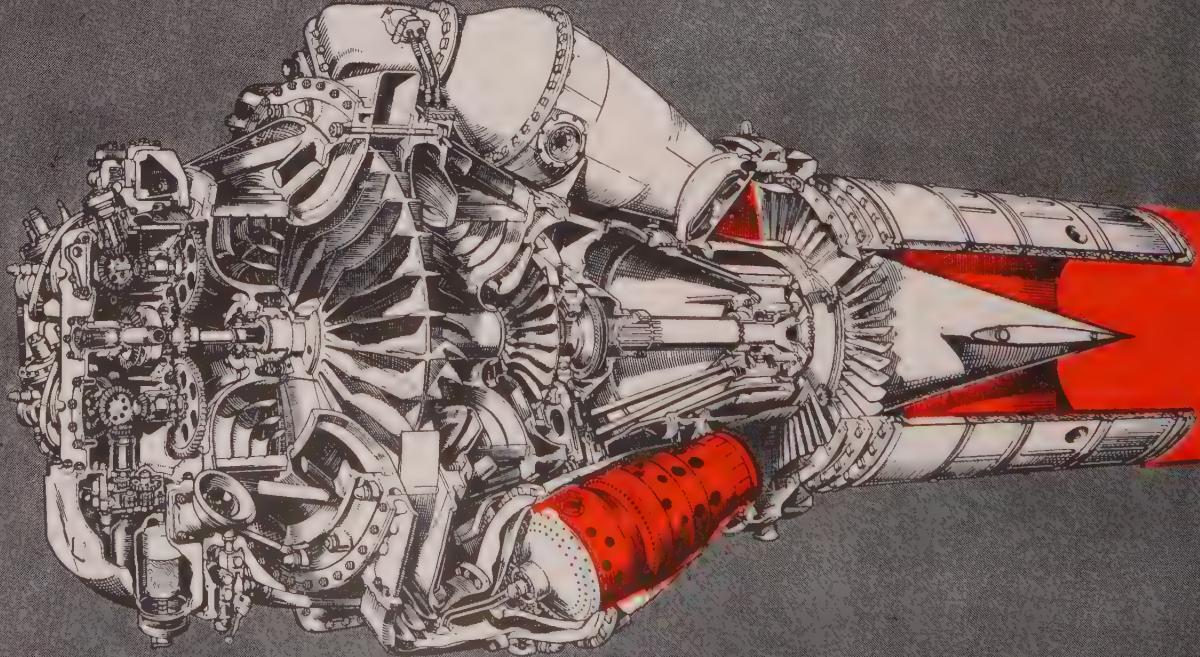
JETS

Widespread use of latest British jet engines highlights their present lead

MOST POWERFUL turboprop now being flight tested is Great Britain's Armstrong-Siddeley 4,000-hp Python



LATEST MODEL of the Whittle-type turbojet is the Rolls-Royce Nene I which delivers 5,000 pounds thrust



By NATHANIEL F. SILSBEY



JET AIRLINER by Vickers-Armstrong is the V.C.1 model of the *Viking*, designed to take two Nene I turbojets and to carry 30 passengers. Estimated top speed is 450 mph

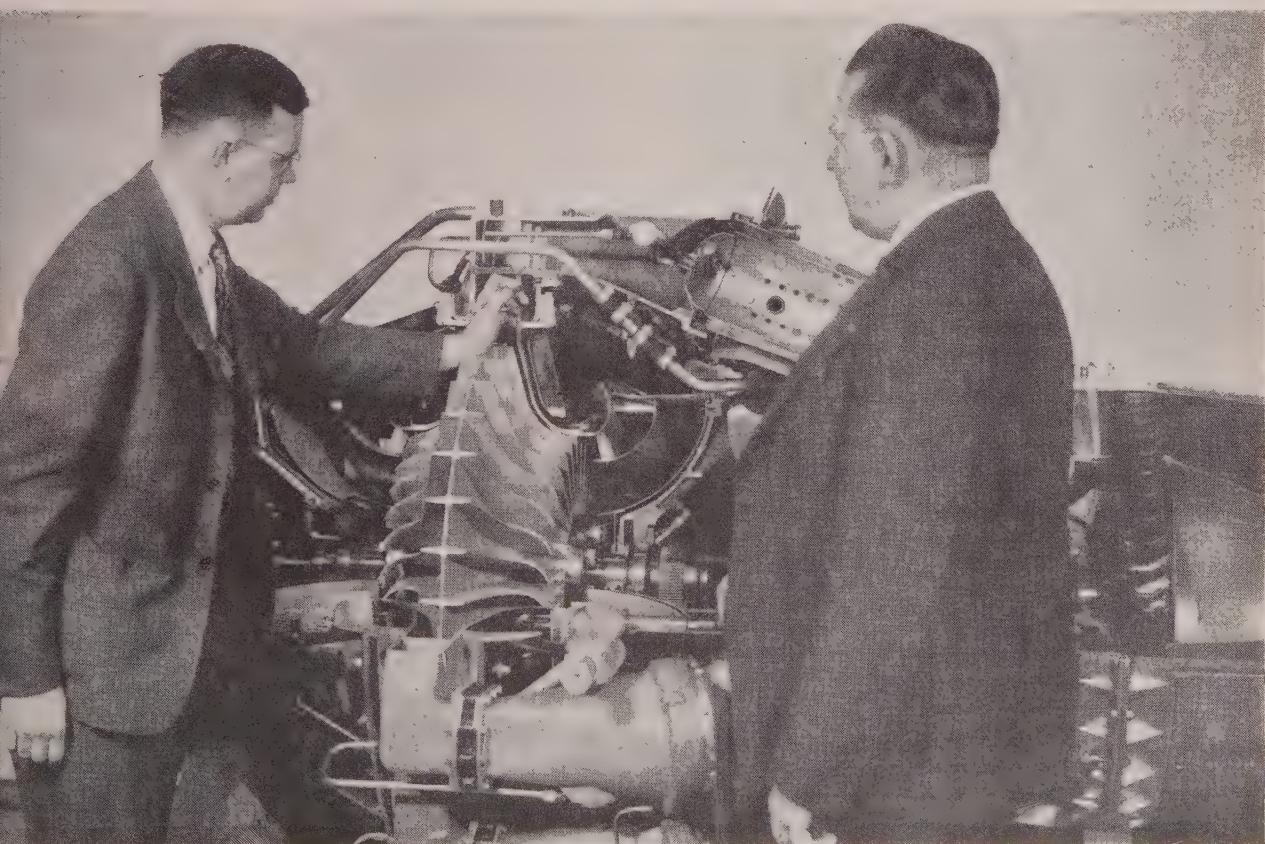
the National Gas Turbine Research Establishment. Leading engineers such as Frank Whittle (he is essentially that, although also an Air Commodore in the RAF), Stanley Hooker of Rolls-Royce, Frank Halford of de Havilland, in their published addresses at various important societies, appear to hold the same view.

Well, so what? Sure, they all believe it, and apparently they have agreed to tell the world about

I-40 TURBOJET examined by General Electric's Dale Streid, designer (left), and G. R. Berg. In production at Allison as the J-33, this unit powers the P-80A

it. However, before dismissing it all as so much propaganda, "let's have a look at the record." Of course the critical evaluation of such an important claim in such a technical field, involving an accurate appraisal of developments in other countries as well, is a pretty complicated business, and this does not pretend to be the last word. Also as the spearhead of research and development is apt to be tied up in military and navy contracts, or otherwise under government restrictions, it is difficult to get at the latest facts.

As a starter, there is a widespread agreement among engineers that as (*Continued on page 60*)



BOB ALLEN (below),
tractor - propeller
proponent, is former
Naval aviator. Today
he handles Cessna's



TRACTOR

For TRACTOR PROPELLER—Robert Allen

DURING my years of flying for the Navy and since then, I have flown "tractors" exclusively, although I have been familiar with the differences between the two ("tractor" and "pusher").

It seems to me the fact that "tractor" propellers have predominated the field for so many years is an argument in their favor and more or less proof of their superiority. With the exception of a half dozen experimental types, Douglas *Mixmaster* and *Cloudster*, Curtiss *Ascender*, Northrop XB-35, and the Consolidated *Vultee XB-36*, to name a few, there have been very few "pusher" models developed, and most of those that reach the flight test stage were military. The exception to this of course has been the use of the "pusher" on civilian seaplanes.

Personally, I prefer the propeller up front in the nose. It's a handy place to have it if you have to abandon ship and hit the silk. With a "tractor" propeller up front you need have no worry about being drawn through the deadly blades behind you. Not only that but if there is a crash and the prop and

engine are ahead of you, they will absorb much of the shock of impact. With the engine above and to the rear, it *could* possibly fall on you in a crash.

It is my belief that stall recovery is better with a "tractor" propeller due to the location of the "pull" ahead of the "CG" and the airfoil, and certainly line maintenance and servicing is easier with the engine in the nose, rather than mounted above the fuselage or wing as in many "pusher" models.

With the engine ahead of the cabin, all engine and propeller controls are direct and simple in connection, and cabin heating is a simple matter.

"Tractor" propellers may be swung by hand in the low horsepower models while the "pusher" propellers, if mounted in the usual "overhead" position, inevitably require a starter and other attendant accessories, resulting in added weight, etc.

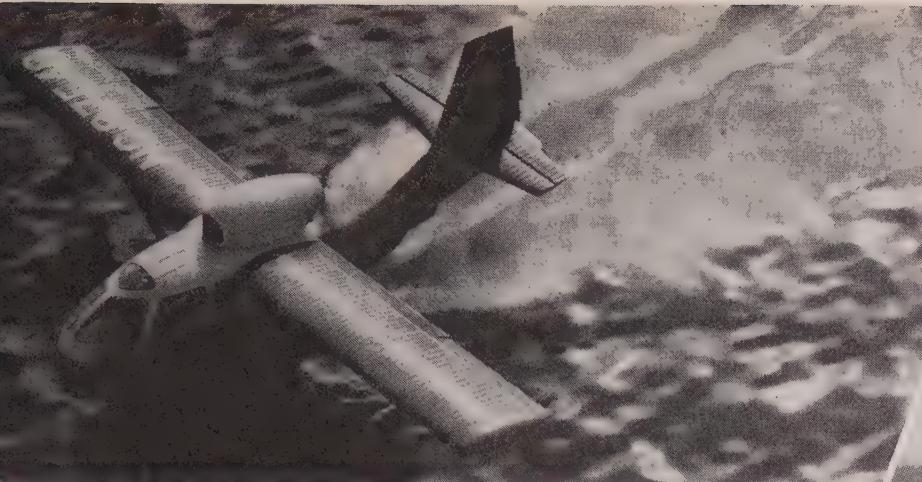
In such models as the *Globe Swift* and *Cessna 140*, the "tractor" propellers are mounted in the nose—easy to install, inspect and swing. I'll cast MY vote for the "tractor." 

AIRMEN OF THE JURY*

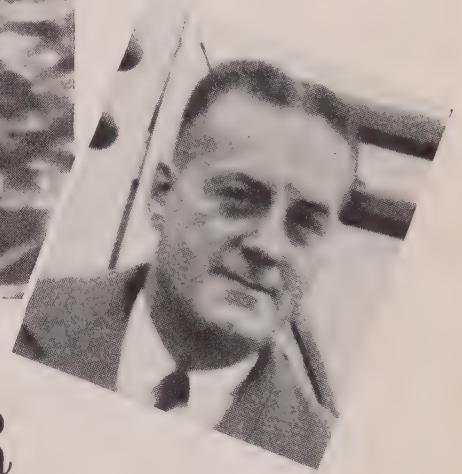
This is YOUR page for debate on all sides of the many phases of the aviation picture. Here, airmen of all ages and "hours" may hear the pros and cons of arguments old or new, the question of the merit of designs, equipment and procedures of interest to you all, and then express YOUR views via the coupon. The value of this page to you and the industry will be in proportion to the number and enthusiasm of the "Airmen of the Jury" who take active part. Results of the readers' verdicts will be published in a coming issue. Each month a new "case" will be presented. This month the *PUSHER PROPELLER* meets the *TRACTOR PROP*. Next month it's *RETRACTABLE* vs. *FIXED LANDING GEAR*. Here are the verdicts of two airmen. **AIRMEN OF THE JURY, WHAT'S YOURS?**

* Conducted by C. B. Colby

Robert Allen learned to fly in 1940, obtained his Private License and shortly thereafter entered the Naval Air Service where he completed the regular Navy Training Program, emerging as an Ensign. He continued flying for the Navy in *SBD's* and *SNJ's*, part of the time as an instructor. Stationed "all over the country" and flying many types of aircraft, he had plenty of time to form his opinions on "tractors" vs "pushers". He's flown about every type of light-plane, as well as military aircraft, and is now President of *Avaire Sales Corp.*, of New York City, handling the pursuit-like *Globe Swift* and the sleek *Cessna 140*. (When I finally cornered him for a picture, he was jubilantly pacing off a 350-foot take-off of his pet Swift demonstrator.) Bob Allen is over in the corner for the *TRACTOR* propeller.



RUSSELL PATTERSON
(below), pusher-propeller proponent, is a former Army Air Force flight instructor



S. P U S H E R

For PUSHER PROPELLER—Russell E. Patterson

BEING Distributor for the *Seabee* may have something to do with it but personally I definitely favor the "pusher" propeller over the "tractor." I have flown many types of "tractors," and of course put many hours in the *Seabee*.

Considering the advantages and disadvantages of both types of propellers, it seems to me that the "pusher" has many more advantages than the propeller mounted forward of the cabin.

For example: with the propeller aft of the cabin as in the "pusher" models, the cabin is quieter and cleaner. There is unlimited visibility forward, especially when the sun is at your back, which in the case of "tractor" propellers often makes blinding highlight areas in the propeller arc. This is particularly annoying when making landings late in the afternoon with the sun directly behind you.

The windshield in the "pusher"-powered models is usually easier to keep clean as there is no oil coating or dust blown back by a propeller. This is particularly true in floatplanes or seaplanes where

the "tractor" propellers often pick up spray and blast it back over the aircraft itself.

Any danger of cockpit damage from shattering propeller blades in partial noseovers is eliminated in the "pusher"-equipped planes. This is also true in case of propeller failure in flight.

Aerodynamically, it is sounder designing to place the power plant and prop behind the airfoil, permitting an undisturbed flow of air over the lifting surface. With the prop aft of the wing, no part or section of it is blanketed by the slip-stream, permitting maximum lift from the entire airfoil.

The hazard of engine fire, while no less with a "pusher"-powered plane, has been reduced as far as the occupants are concerned. With a power plant and propeller mounted in the nose, an engine fire has no place to go but back, directly into the passenger compartment. Fire in the engine nacelle of a "pusher" blows aft or away from any passenger area.

Considering all these points it is easy to see why I am enthusiastic about the use of "pusher" props. 

AIRMEN OF THE JURY

- This is your ballot on the case of Tractors vs. Pushers
- I favor TRACTORS _____ I favor PUSHERS _____
- BECAUSE: _____

- _____
- _____
- _____
- _____
- _____
- Name _____ License Number _____ Hrs. _____
- Address _____ City _____ State _____
- Do you own a plane? _____ Make _____ Type _____ H.P. _____

GET ACQUAINTED WITH

**A few easy do's and don't's plus
a little practice in watching for
trouble symptoms pay big dividends**

A SHORT time ago, while visiting an airport operated by a World War I pilot, I asked the oldtimer what he thought of modern lightplane engines. I expected praise. His answer sent me into a mental tailspin.

"They're too good," he said, with that cock-sure attitude that comes from 30 years of experience.

Immediately I sensed something behind his words—some sound advice that might fit in the modern pilot's tool kit. "What do you mean, 'too good'?" I pressed.

The oldtimer watched an incoming student porpoise down the runway, then clarified his meaning. "Engines today are so good that the average lightplane pilot seldom encounters serious trouble. This makes him careless. He doesn't acquaint himself with engine operation, and how to get all that an engine can give. He doesn't care a damn as long as the prop keeps turning. Usually this results in expensive repair bills. But sometimes . . . well, look up the figures!"

The oldtimer left me and hurried toward the fuel pit to service a waiting tandem.

I did look up the figures. Then I knew what Oldtimer had meant. Between 1940 and 1944, while personal flying was sharply curtailed by the war, 1,278 reported accidents were caused by operational engine failure. This figure excludes engine

ENGINE CHECK-UP calls for close watch over plane's mags. If there's a break in the wiring to the magneto's, get a licensed mechanic to replace the worn wiring

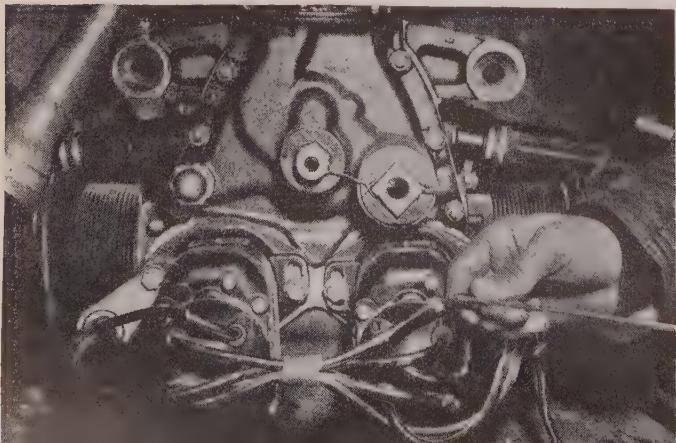
trouble caused by structural failure, and probably excludes a lot of failures that brought the pilot down in a potato patch with no more damage than ruffled nerves and injured dignity.

Additional figures stamped Oldtimer's analysis of the situation as brutally true. Of the 1,278 failures, 919 originated in the fuel-supply system, somewhere between the fuel tank filler cap and the intake valves. But most revealing, post-accident analysis indicated that between 60 and 70 per cent of these fuel system failures could have been prevented. Therefore, excusing the pilot for the 359 failures not due to fuel system troubles, a very generous gesture, *approximately 45 per cent of the 1,278 accidents were preventable*.

The several hundred fatalities resulting from these accidents is certainly a small percentage figure when compared to the number of private licenses now on issue. But more than the pilot's life is at stake when his engine quits and he washes out against the side of a hill. The prestige of aviation rides with him. It is safe to estimate that for every head-lined airplane crash, several of the more timid prospective souls cancel half-formed plans to fly. Besides risking his own life, the careless pilot is driving a knife into the back of the aviation industry.

Modern lightplane engines are good, but they are not perfect. Maximum service and dependability

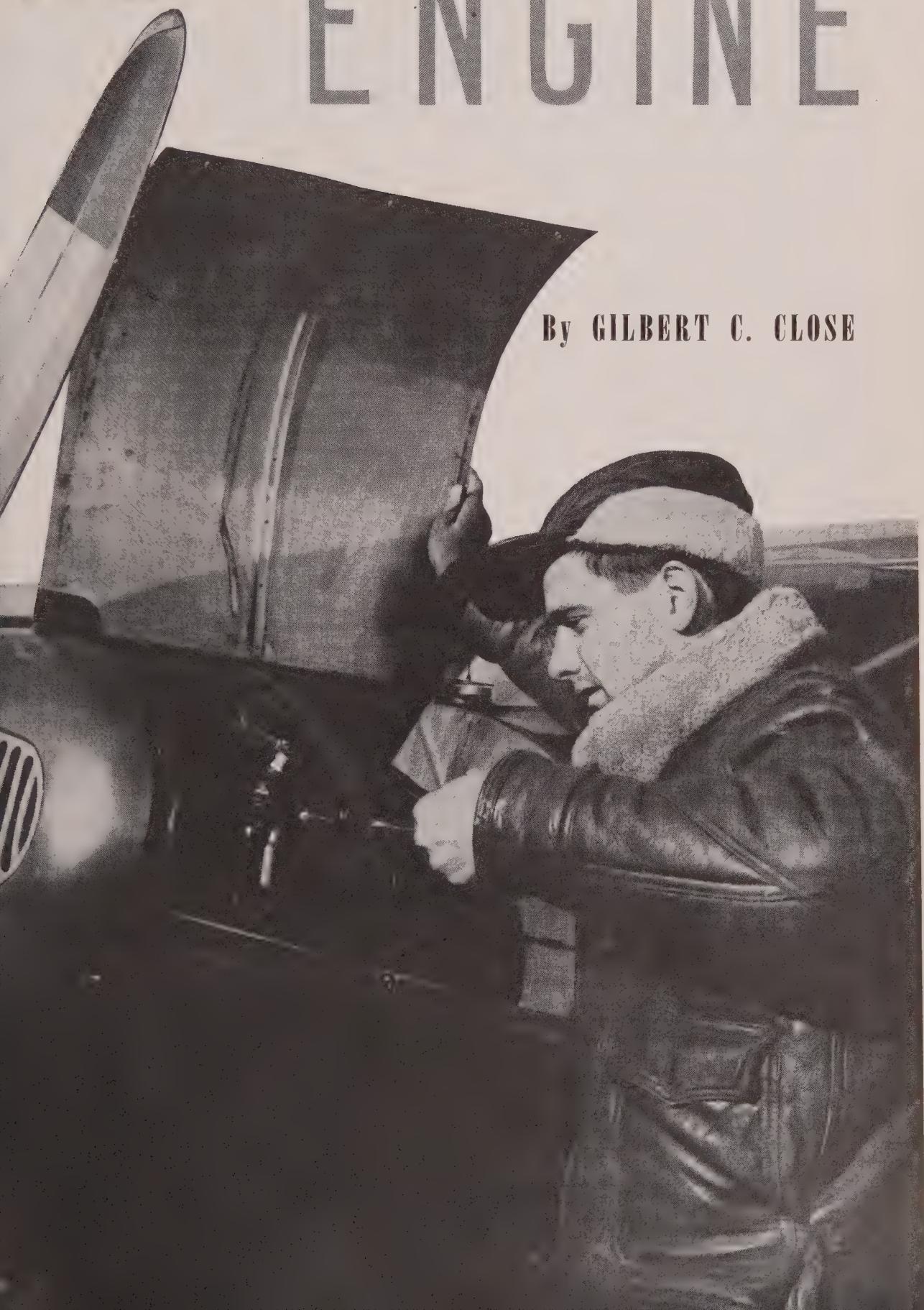
SPARK PLUGS that are dirty should be pulled. When new plugs burn out, there's usually an "outside" reason for it. See that the high-tension cables aren't punctured



OUR

ENGINE

By GILBERT C. CLOSE



is predicated upon sensible operation and protection from various conditions that cause engine deterioration. That's a mouthful of heavy words, but they shouldn't scare anyone. A pilot can learn all he needs to know about his engine much quicker than he can learn to fly a smooth figure eight, and the engine knowledge that he stores away will be just as useful in the long run.

In fact, what a pilot needs to know about his engine is limited to a few simple "do's" and "don'ts," and the ability to recognize in engine operation the symptoms that either forecast trouble, or indicate that trouble has arrived in a minor form. Other engine knowledge, that dealing specially with maintenance adjustments and repair operations, is in the realm of the licensed mechanic, and there it should stay. The private pilot should never attempt an adjustment or repair operation that, if incorrectly made, could affect the operation or the efficiency of his very dependable aircraft engine.

One specific "don't" that many pilots are prone to ignore is the well-founded warning to never use substitute parts. Wire and twine string may have kept the old Model T rambling for another thousand miles, but so far the CAA has failed to approve this type of repairs for certificated aircraft. Newt Williams could tell you about the use of substitute parts. He learned the hard way.

Newt was going fishing that day. He was out to the airport at 6 a.m., his gear stowed, engine started, and taxiing toward the fuel pit. The night watchman, serving as emergency pit attendant, noticed

that Newt's fuel tank cap was missing. It had probably jiggled off unnoticed on the previous flight. What to do? The manager with the keys to the parts room wouldn't be around before 9 o'clock.

Bad luck was with Newt that day. The threads in the radiator cap from the jalopy he had driven to the field matched perfectly. Newt screwed it on tight, then, his mind turning to fishy problems, taxied down the runway and took off. At 200 feet, the engine coughed a few times, then stopped.

With a wrench, Newt brought his mind back from the cool green depths, and looked for a place to land. He made it in a wild hay meadow, on three points—wing tip, left wheel and propeller. He had forgotten a minor point when substituting for the missing fuel-tank cap. Fuel-tank caps are vented to admit air as fuel is withdrawn from the tank. Radiator caps aren't vented, as radiators are equipped with an overflow pipe. A vacuum had formed in the fuel tank, working against the action of the pump supplying fuel to the engine.

This may seem like an extreme example, but a study of CAA reports indicates numerous instances where accidents have been caused by such slight oversights. Fires have been caused by using wires too small to carry the necessary load; numerous repair bills and engine failures have resulted from using the wrong type gasoline, especially automobile gasoline which should never be used. The volatility of automobile gasoline is higher than specially blended aviation gasoline, and vapor lock is more liable to occur.

(Continued on page 65)

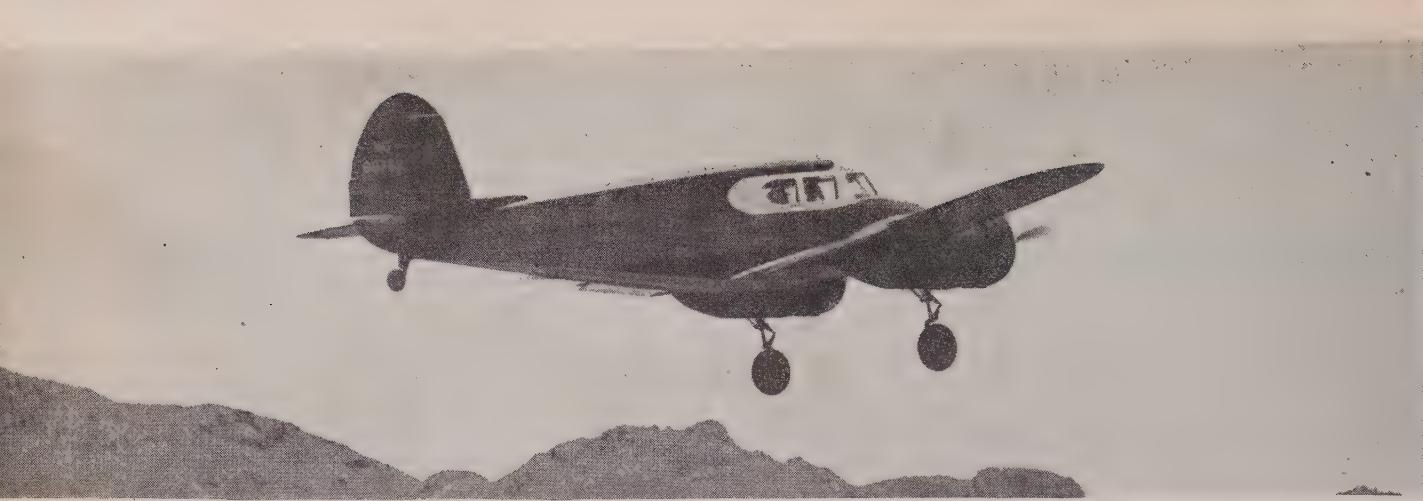
WEATHER REPORT comes under heading of preflight check-up—engine cowling catches, fuel caps (air vent should be turned forward) and ground surface (for oil-leak signs) comprise remaining engine preflight



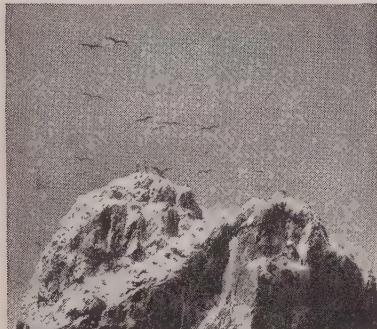
The FLYING SPORTSMAN



A Special Section... Sports in Season



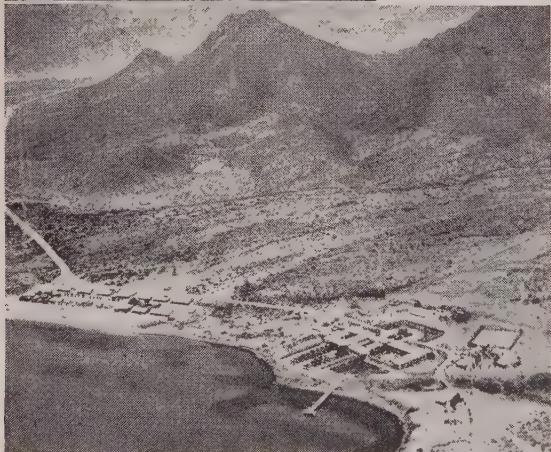
ANGLER'S HOLIDAY



Air-minded vacationers try fisherman's paradise at Guaymas

By TOMMY LARK

As Told to Tamara Andreeva



AIR TRIP from Tucson to Guaymas, Mexico was made in a five-passenger Cessna

MIRAMAR area lay before us as pilot Lloyd Thompson made his approach to field

GUAYMAS harbor, bathed in early morning sun, was picture of peace, tranquility

LLOYD THOMPSON gave our twin-engine Cessna full throttle. It rose over the asphalt runway of the Tucson airport in a roar of motors, leaving far behind the yawning hangar. Thompson circled once, waggled the wings, then we headed South. Three hundred miles away on the east shore of the Gulf of California lay Guaymas, the fisherman's paradise and the Nadir of our dreams. Thompson turned his head and cast a knowing look at the clutter of our equipment behind him.

The roomy five-passenger plane which now held only four—my wife Betty, her friend Virginia, Virginia's husband Louis, and me—seemed packed





TROLLING from an outboard boat provided by hotel, the author pulled rock bass from Bocochibampo Bay

AUTHOR'S wife, not to be outdone, displayed her skill by hauling in a rock bass even bigger than her husband's

to capacity. And packed it was—bristling with fishing reels and bulging with ill-folded dungarees. True to angling tradition, the girls would not leave out frayed straw hats. On the other hand they insisted on a heavy quota of suitcases with glad rags. Without them they flatly refused to attend the annual Fishermen's Fiesta—Fiesta de la Pesca—held for the tourists' delight at one of the Guaymas hotels. Actually they spent their happiest hours in a pair of dirty dungarees and old sunsuits, but then I am getting head of my story.

At first everyone's mood was that of suppressed excitement. Just think—striped marlin, sailfish, mackerel, swordfish, Spanish mackerel, dolphin, grouper, skipjack, rooster fish, striped rock bass—why the list was practically endless. Each one of us visualized himself in a Napoleonic pose in the bow of a cruiser, trawling behind a 150-pound catch. We weren't going to settle for anything less than 150 pounds, no sir. Our Mexican fishing licenses cost us five bucks apiece, and we were not going to pay the price of steak for fish. It was agreed in advance that Betty would harpoon a giant manta



HOOKED, a fighting rooster fish is brought to surface. Note strip of mackerel bait

HUSBANDS are poor fishermen (they say), so Betty and Virginia try their luck alone



CRUISER, equipped for deep-sea fishing, leaves pier at Hotel Playa de Cortes



YEAR'S CHAMP. Howard J. Ferris of Monrovia, California, landed a 293-pound striped marlin off Guaymas

HOLIDAY entertainment at the Hotel Playa de Cortes featured Mexican dancers as part of Las Fiestas Pesca



ray; Virginia would catch the biggest sailfish ever photographed, and Louis and I would slug it out with two of the best and most bellicose swordfish Bocochibampo Bay could offer.

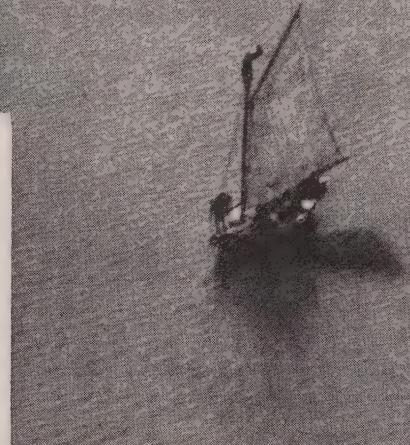
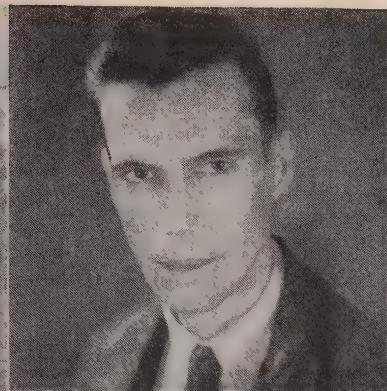
The Hotel promised to provide us with an Elko cruiser or any one of their 10 Higgins PT Juniors with 100-hp motors—a deep sea fisherman's dream. They would give us skiffs, sailboats, anything we wanted. On the advice of Monte Mansfield, well-known Tucson fishing enthusiast who often fished at Guaymas, we took along medium tackle. He assured us it was the tackle to give both the fish and the fisherman a sporting chance. How were we to know that he was on the side of the fish? But again I am running ahead of my story.

In two hours we were circling over our goal. Below was the blue water of the Bocochibampo Bay and Cabo Haro—Ring Cape—saddled by an old lighthouse. The blue contrasted with the bright yellow of the sands on the Miramar beach, hemmed in by two red-roofed hotels. Just north of one hotel was the sprawling city of Guaymas and the twin mountains of Las Tetas de Cabra, still, colorful, lazily casual. Against the azure of the bay and the sky stood out the towers of the Cathedral, the red roofs of the adobe cottages. Small yachts lay snug to the pier. Northward was San Pedro Island, considered one of the best marlin-fishing grounds in the world. And against the sparkling ripples of the bay patterning the hulls of sporting cruisers stood great bare Guano Rock, for centuries a landing spot of frigate birds, gulls and pelicans. As we passed overhead, they rose over it like fleeting mist.

We made plans to fish (*Continued on page 49*)

BIG FISH were caught by others. Here Lloyd Thompson, our pilot, looks over a sailfish with Mr. and Mrs. Davis





Winged Warden

A Flying Sportsman feature

By TOM OMSTEAD

GULF commercial fishermen are becoming increasingly familiar with a tiny airplane which sometimes hovers wasp-like above their boats.

The appearance of this "flying eye" is often sudden and without warning. Flying low, it circles watchfully around the boats, taking in every detail of craft and crew.

And if they're up to no shenanigans chances are the boat-crew will raise a hand in friendly greeting—for the plane is being operated by Bob Tanner of Corpus Christi, Texas, who is reputed to be one of the few flying game and fish wardens in the United States.

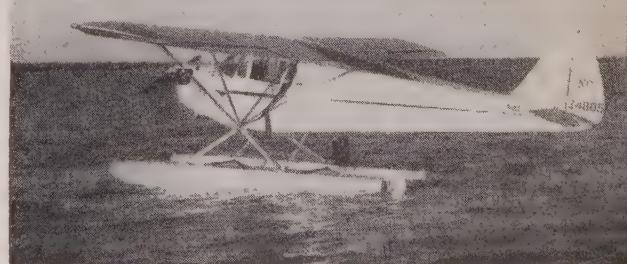
Tanner represents the Texas Game, Fish and Oyster Commission. The waters for which he is responsible are so wide that to attempt adequate coverage by any other means would be impossible. Thus the airplane, which is a Piper Cub powered with a 65-hp Continental engine, and equipped with floats, is Tanner's means of getting around. A tandem, Tanner's ship sometimes carries another official of the Game Commission, or any other interested person who happens to express a desire to see how the flying warden operates.

With improved transport facilities seafood is becoming ever more popular in inland areas and the increased market has attracted its share of those who would take unfair advantage of the bonanza. It is the primary objective of Warden Tanner to ferret out these (Continued on page 75)

FLYING WARDEN Bob Tanner is no stranger to fishermen of the Lower Lagoon. Here Tanner drops down to see that two boats are not illegally dragging nets



PIPELINE CHECK-UP is another chore for Warden Tanner. Slow speed of the Cub makes job an easy one





PORTRABLE BOAT by Goodyear, of rubber-coated nylon fabric, is loaded by flying sportsman Larkey into his Cessna

CAN I CARRY A BOAT?

BOAT INFLATED, Joe Nick (rowing), Jack Larkey and dog Blackie start off to bag their quota of ducks.

Lightweight boats and canoes, available for personal aircraft, add to a plane's utility for the sportsman



A Flying Sportsman Feature

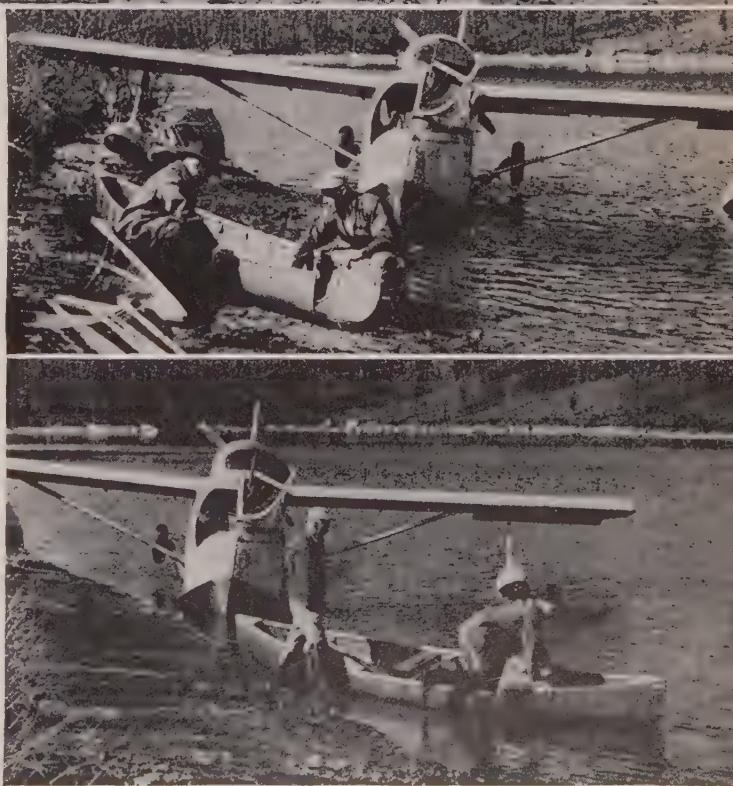
By J. A. EMMETT



SECTIONAL SKIFF of molded plastic by Link Aviation is 14½ feet long, weighs 70 pounds, has water-proofed fabric covering. It is carried in two large bags, and can be quickly assembled. The canoe weighs 65 pounds

WITH personal planes putting Rocky Mountain trout in the Indiana fisherman's backyard and making Maine's lakes the weekend playground of New Jerseyites, many a sportsman is thinking of buying a plane largely for the purpose of reaching isolated areas within a reasonable time —getting back into those wilderness sections that hold every promise of good sport. And this whether his interest is in fishing or hunting, nature photography or exploration.

As boating editor for one of the outdoor magazines I've been asked such questions as: "What can be carried in the way of a boat?" "Are there other suitable types besides inflatable boats and rafts?" "How satisfactory are these apt to be in actual use in the water?" "If I buy a plane in, say, the \$3,000 class, a small Cessna or an (Continued on page 48)



FLYING HUNTSMEN

Flying Sportsmen feature from N. C. Dept. of Conservation



BEACH LANDINGS were made by the incoming planes — a Cessna and a Waco which brought hunters from Ohio. Having flown directly from home, the hunters wore their hunting clothes. Next day came the shooting

OLE Daniel Boone would have scratched the fur of his cap and shaken his head "Nay," if someone had told him that years hence other musket-bearing men would be tracking wild game and getting there by plane instead of on foot. But Daniel Boone or not, it is a fact, and North Carolina is one state to prove it.

Off the coast of the Tar Heel state, there exists a chain of islands, the whole chain called Outer Banks. One of these islands, Ocracoke to be exact, lies just 30 miles off the shores of N.C. For years generations of birds, duck and geese, have found a

OCRACOKE HUNTERS, morning after arrival, pushed off from island to go to the blinds. Guides had gone on ahead to set out decoys on beaches, in marshes. After a day of shooting, hunters were picked up again by boat





FINAL STEP twixt the wing and the lip was a good singeing at the stove, artfully done by the Club's cook. Next came the oven. Brace of geese, killed two days before, provided the happy hunters with a hearty meal

winter sanctuary along the Outer Banks. To get to these islands was such a torturous trip by train or car and then by boat that only a few extra hardy and very adventurous souls made the trip each year for hunting purposes. This year, however, the birds got a shock—sharp-eyed hunters came in quantity. And it was the airplane that made it possible.

With the inauguration of plane service to Ocracoke Island, it is now possible for a Pennsylvanian, for example, to fly down one afternoon, shoot the next morning, and be home again before dark on the second day. Not a few huntsmen did just that,

DAY'S BAG, two geese apiece, were given to the cook at Beachcombers' Club, a men-only place on Ocracoke. Geese were left under feathers few days, then plucked by Willie and Jurd Williams, guides at Beachcombers



and they came from Maryland, New York, Ohio and from as far away as Illinois.

Not all air travel was via an established airline; many a hunter came in via his own personal plane or a chartered one. It was the rule rather than the exception for an Ocracoke Island-bound sportsman to don his shooting clothes at home, grab a gun and box of ammunition, step into a plane and in a few hours, step out again, but this time on the beach landing field of a hunter's paradise.

Ordinarily, sportsmen got aboard special planes at either Norfolk, Virginia (one hour away from Ocracoke), or Manteo or Beaufort, North Carolina (30 minutes away). Many, however, did charter their own airplanes and were flown in from far-distant places. Private flyers, as many as five in one day, came in, too, to enjoy the hunting on the Outer Banks. Ocracoke's hotel and gun club, exclu-



HIGHLIGHT of trip was after-dinner gabfest when "it-really-happened" yarns were retold

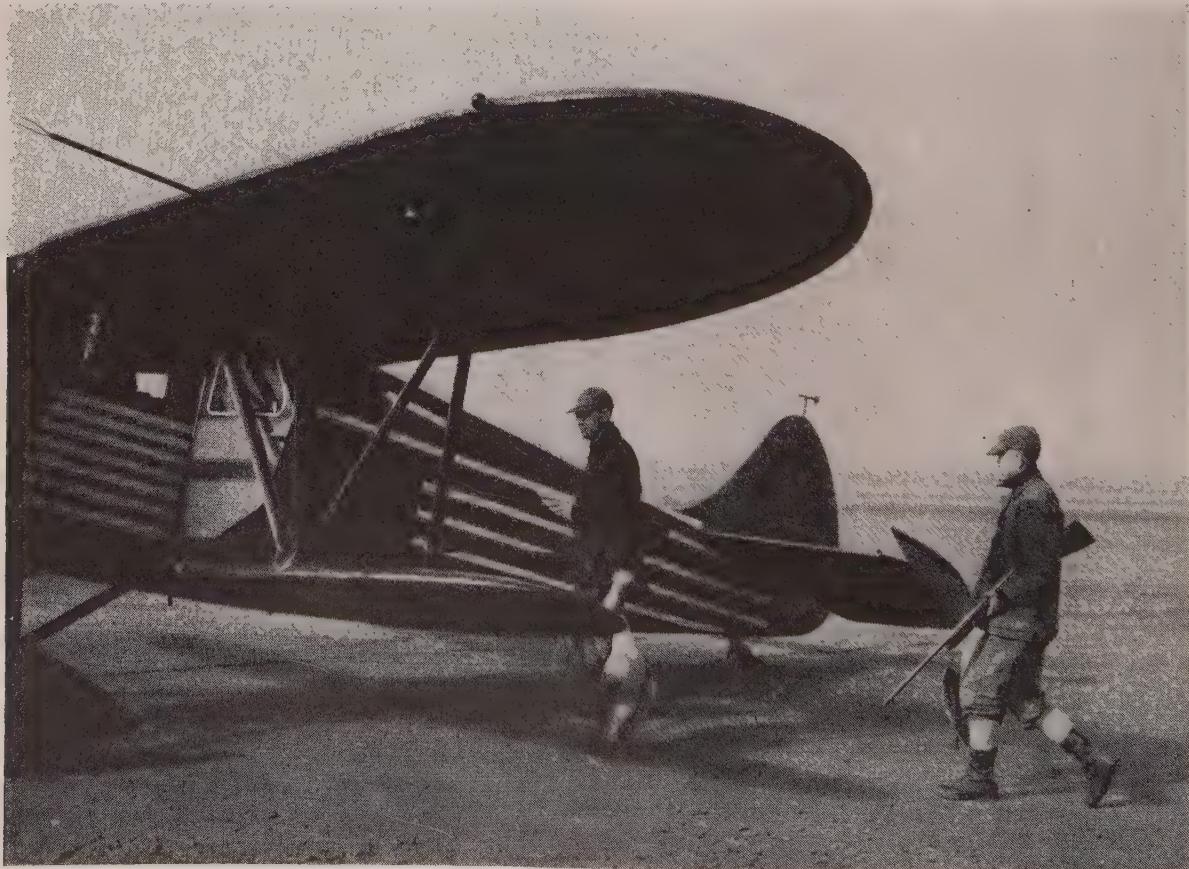
sively for men, were crowded most of the season.

One group which was flown in via chartered Waco included W. E. Leitch, W. S. Unger, officials of the Carnegie-Illinois Steel Company, Pittsburgh; Congressman D. Emmert Brumbaugh of Altoona, Pennsylvania; J. C. Hanawalt, Baltimore, Md.; L. Y. Green, Philadelphia; and D. R. Sieber of Baltimore.

Soon after the hunters arrived at Ocracoke, guides went out in flat-bottom boats and set up decoys around the pillbox-type blinds. Then the hunters

came in. The boys were sometimes hardpressed to eat all that they had bagged. As a result, dozens of year-round inhabitants of Ocracoke Island were made presents of geese—left over bounty of the flying huntsmen. All the hunters agreed the junket was swell sport and, thanks to the airplane, they'd be enjoying it oftener than they had before.

HOMEWARD BOUND, the successful hunters climbed aboard the Waco and were home in time for supper





FLYING SPORTSMAN SHOULD CARRY CAMERA

Charter Operator Flies Triggermen to Hunt

Unique sports event: the single-shot antelope hunt

Charter air service operator Grover, recently flew members of Colorado's rifle team to Lander, Wyoming, where the team competed with five-man groups from Wyoming and Montana in a one-shot antelope hunt. The leading sports event of the season, this single-point contest allows the hunters one shot each. Thus, if and when an antelope herd is sighted, each huntsman is allowed only one shot. The team officially bags the most animals wins.

Charter operator Grover had Hunt Master M. Hunter of Denver, Owen Tytegraff, one of the judges, and Ralph Taggart, a member of the Colorado rifle team, as passengers in his twin-engine Cessna. Mr. Grover is the man who has successfully combined business with pleasure. Being a sportsman as well as a pilot, Mr. Grover operates an air service which specializes in flying hunting and fishing parties in some of the rich ranch and game sections of the country.



PILOT GROVER, in rear, and Judge Owen Tytegraff display one-shot antelope trophy

Lens is handy for aerial reconnaissance, game counts

Wise is the flying sportsman who tucks a camera in among the tackle and guns on his trips. This "extra equipment" might even save him time and money. How many of us have flown over areas—on our way to or from a favorite hunting spot—which we thought might make a good place to land and camp, but didn't because of unfamiliarity with the area! Carrying a camera can provide the means for studying the territory in safety and leisure after the trip. It's a fairly simple matter to be your own surveyor, and it might even save your neck. If you are accustomed to flying the same routes each year for the various seasons, it makes sense to know the territory over which you fly, in case of an emergency landing.

Photographs taken from the air can be blown up large enough to provide greater detail than it would be possible to spot with the naked eye without flying precariously low and wasting fuel in circling again and again. For successful aerial pictures, a fairly heavy camera is necessary, and 4x5 film is about the smallest size which will record enough detail to show in an enlargement. The usual precautions for aerial photography apply: guarding against vibration, extra light allowance, desirability of dark filters, etc.

If you're an amateur photographer as well as a hunter, then shoot the out-of-season game on your deer trip with your camera. Even a Brownie is handy here. You can label these pictures "The ones that got away" for your credulous friends. Now that the long-awaited Ektachrome is on the market, you can capture the beauty of your favorite haunts in all their colorful splendor—whether it's the verdant Floridian Everglades, the snowy crags of Wyoming, or sunrise on Lake Michigan—and process them at home the next day. There's no end to the possibilities when you're a flying sportsman-photographer.

AIRLINE INAUGURATES SKI BROADCAST

Hunters Get New Gunsight

Hunters are already reaping the results of new research and experiment, in the form of a new lightweight gunsight now appearing on the market. The bull's-eye pattern is comprised of rainbow-hued concentric circles, and the trade name of the product is "Kalsite." It is manufactured by the Kalsite Manufacturing Company.

REPORT OPERATOR Arranges Hunting Parties

If you own your own plane or if you can hire one, plan to go quail or wild turkey hunting next Thanksgiving or Christmas season. Bill Hobbs, operator of the Wilmington Island Airport near Savannah, Georgia, will help you out; so will the management of Savannah's General Oglethorpe Hotel. There's plenty of game in the vicinity of Savannah, not to mention South Carolina across the Savannah River. If you fly the Wilmington Island Airport, just a mile from the General Oglethorpe Hotel, Hobbs will arrange hunting parties for you. But give him some advance notice of your coming because most of the hunting is done on private land, and arrangements have to be made to secure permission to hunt. Or if it's fishing you want, it's Connie's Yacht Basin, located just

Colonial Airlines, ski-promoters from way back, chalk up another first with their new weekly ski broadcasts over WGN, the first sponsored ski broadcast in the history of radio. Frank Elkins, America's foremost ski reporter, makes the broadcasts, giving up-to-the-minute reports on conditions at major ski centers in the Northeastern United States and Canada, most of which are serviced by Colonial ski-planes. In a ski salute each week, Elkins honors the individual, organization or community which has contributed most to skiing.

HUNTERS AIR-COMMUTE IN S. D.

General Wainwright really likes to hunt. Last fall, after flying to Winner, South Dakota, for some pheasant shooting, he found the county roads impassable from rain and snow. Not to be deterred, he and his party of eight were flown to good hunting territory 25 miles north of Winner. The planes used were a *Swift*, a *Silvaire*, a *Champion*, and a *Taylorcraft*. No difficulty was experienced in landing the hunting party in meadows adjacent to fields abounding in pheasant. The hunters were picked up and flown back to Winner each evening.

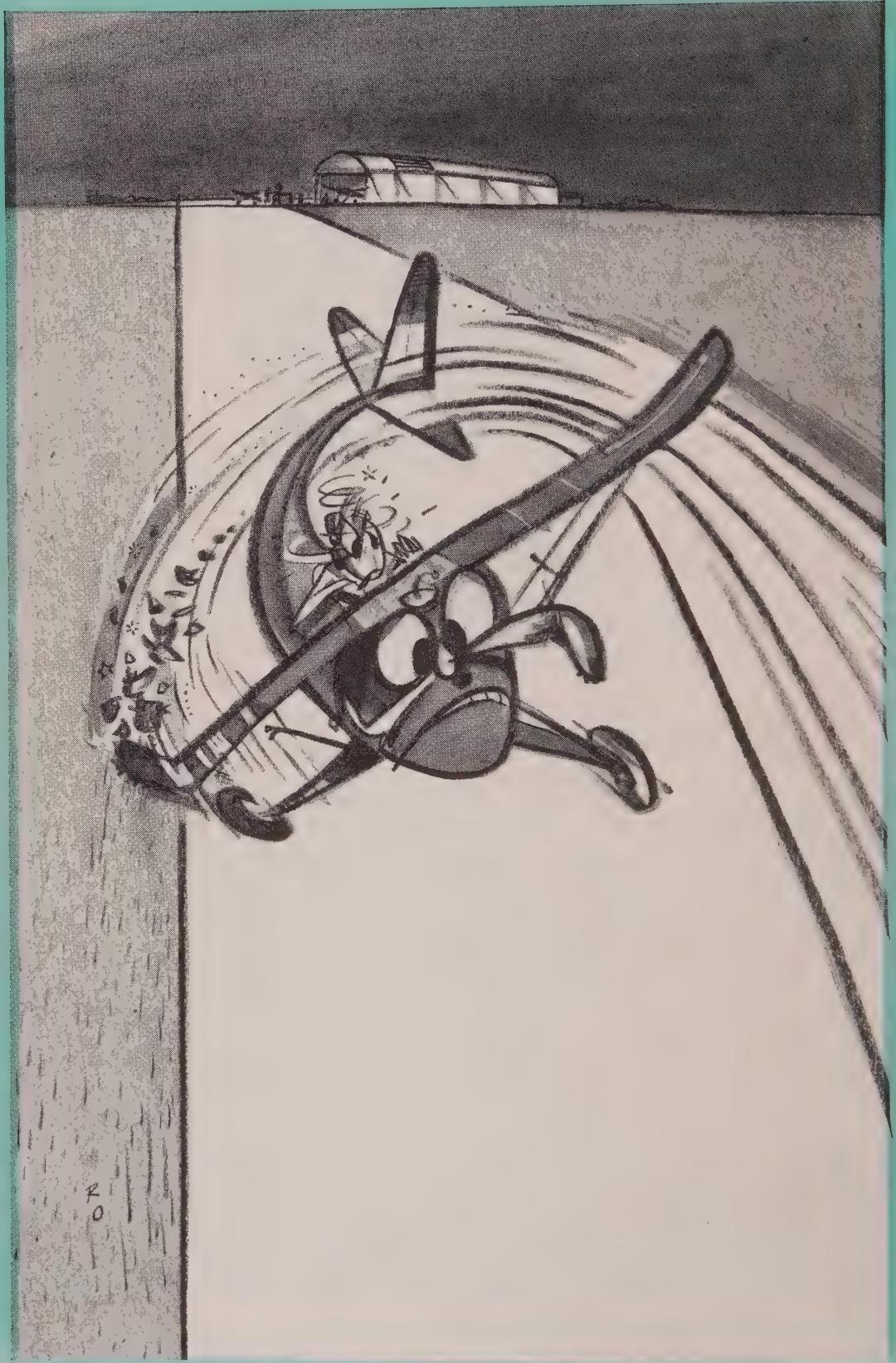
300 yards from the airport. There you can get everything from live bait to boats. All of this, by the way, within easy reach of one of the South's best hotels . . . and, incidentally, one hotel that caters to the flying trade. Add Savannah as a port of call.

Illegal Hunting on Increase

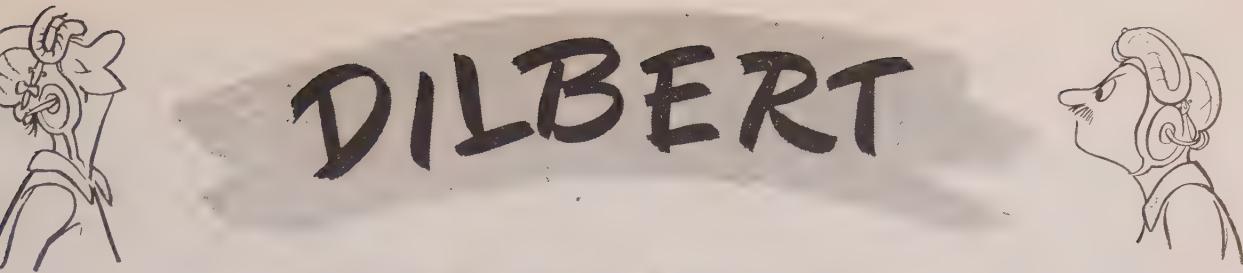
Reports from various sections of the country indicate that illegal hunting and killing of game has increased sharply in the past year. It is difficult to determine the cause of this, but the results are easy to see—a depleted game supply for years to come. It should be emphasized that it is good common sense (and self-protection) for hunters to report infractions of the rules.

Some legislators are not only suggesting more stringent controls, but are also advocating uniform bag limits in all areas. They claim that a hunter who gets two less than the limit (in his state) of, say, 13 rabbits, will say he had a "fair" day, while another hunter who gets a full limit (in his state) of, say, six rabbits, will say he had a "very good" day. Therefore, they declare, uniformity at the minimum level of present

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"Repeated ground loops gave Dilbert curvature of the spine!"



DILBERT

By S. H. Warner and Robert C. Osborn

BEWARE DOWN-DRAFTS—An instructor coached his student through a practice landing at an outlying field. The approach was low and as the airplane passed over the boundary fence, it settled too fast, hooked the tail wheel in the fence, made a hard landing and ground looped into a ditch.

Wind at the time was approximately 25 mph. The landing was being made on the upslope of a small hill. This combination was considered to have caused the accident, the hill blanking out the wind as the plane neared the ground.

I have no quarrel with this theory, but I believe one other thing was equally involved, that is the downdraft which is found on the lee side of obstructions. Ask any glider pilot. They become so expert on air currents that they even know which side of

a cloud to approach to get an updraft.

Alaska pilots soon learn to avoid the lee side of cliffs and mountains. Turbulence and downdrafts are so vicious up there

that you get smacked right down to the ground, despite anything you can do, even in a plane having reserve power for such an emergency.

Even the Palisades along the Hudson River can develop some dangerous downdrafts. I particularly remember one seaplane take-off. Everything went normally until I had gained approximately 100 feet altitude. At that point the stuff hit me and despite full power on both engines and a climbing attitude, I was slapped back on the water. I taxied well clear of the Palisades before trying it again.

So be wise and don't fly near such obstructions. If you can't do that, at (Continued on page 70)

"Don't fool with clouds . . ."



"Dilbert learned the hard way!"



Bellanca

(Continued from page 21)

able landing gear and flaps. If the owner wants an automatic pitch-changing propeller (Kopper's *Aeromatic*)—he chooses the Model B. In Model C the added features are a pair of mufflers on the engine and a two-way radio (the GE *Radiofone*). If the pilot still isn't satisfied and wants more than just standard instruments—viz. altimeter, airspeed indicator, tachometer, oil temperature and pressure gauges, and electric fuel gauge—he elects to own Model D and has in it an instrument layout that includes turn-bank indicator, rate-of-climb and sensitive altimeter. Still another, and fifth choice—the pilot can buy the deluxe Model E, and have all the extras plus landing lights and flares and special wool and leather-trim upholstery.

A typical *Cruisair Senior* owner is the Koos Furniture Company of Rahway, New Jersey. Rahway (population—20,000) is located on the New Jersey coast some 20 miles below the Statue of Liberty and has at its back door the Shinn Woodbridge Airport. Rahway's Koos company—a retail concern—is several hundred miles from the furniture factories to which it periodically sends its buyers. At a recent business sales meeting of Koos buyers Dick Hart, one of the buyers, suggested the furniture company own their own plane. Dick flew military planes as an AAF pilot during 1943, 1944 and '45. He spoke, and authoritatively, of the convenience of taking off on an overnight's notice for Grand Rapids and Chicago and other furniture cities both midwest and south.

Fortunately, Charles Koos Jr., president of Koos Furniture Company was there—lending a sympathetic ear one minute and in the next giving Hart the go-ahead to buy a plane for the company!

Hart bought a Bellanca (Model D). The *Cruisair Senior* had the cruising range, the airspeed and the capacity to meet the Company requirements and the flight characteristics Dick wanted. Most trips are to Grand Rapids, Michigan, 850 air miles away. Pilot Hart has made the trip in as little as 5 hours 5 minutes with a tail wind, and 6 hours 40 minutes with a head wind.

Usually three buyers, one being Pilot Hart, make the trip—taking all the luggage along they need. On this basis Dick averaged the costs after the first trial run and made up an expense sheet to cover four years' operation of the plane. The figures proved that in that time the plane will have been paid for. Here's the tabulation:

Gas and Oil to Grand Rapids.....	\$ 13.99
from Grand Rapids...	18.78
	\$ 32.77
Per month:	
Hangar fee	35.00
Depreciation (4-year basis)	138.23
Hull insurance	83.73
Liability insurance	13.32
Accident insurance	13.09
	\$316.14

The train and airline fare would be \$225.29—or \$90.85 less than the cost of the plane on a basis of one trip a month. However, at the end of four years the depreciation of the plane would no longer be considered in the expense accounting. In the meantime the

Company can and does use the plane to expedite its orders and cover short hops. In the meantime, too, the buyers save the Company and themselves considerable to-and-fro from airline terminal traveling because they all live within a five-mile radius of Shinn Woodbridge Airport where the plane is hangared.

Having flown the *Cruisair Senior* on and off of several airports on a triangle cross-country journey, the writer looked at the plane through the eyes of a pilot and this article will confine itself to the pros and cons of this plane . . . the whys and wherefores that lead pilots, such as Dick Hart of Koos Furniture Company, to choose this plane to meet his company's transportation needs.

The *Cruisair Senior* has one door for entrance. It is on the right side. Pilot and passengers step up onto the wing and can pull themselves up by a hand grip on the cabin roof. Standing room on the plywood wing is confined to the conventional strip closeby the fuselage. When parked, flaps should be set down as this will discourage anyone from climbing on the wing other than the "cat-

ing under the toggle to indicate which is the starter) is moved to the right and the engine then turns over. The use of a starter in lieu of someone swinging your prop is a welcome new in personal planes. Pilots should not abuse the engine and distributor system by misuse of starters—a little careful instruction from those experienced with electric starters will assure you longer starter life and usually quicker response.

The adjustable prop mechanism is automatic so as soon as the engine turns over the pilot warms up his engine by increasing the tachometer reading to about 1,100 rpm. Oil temperature is the instrument that will give you the go ahead—it must read 40°, but a pilot can taxi to take-off while waiting for this reading. Before starting out on the taxi trip, the fuel supply can be checked by an electric switch beneath the fuel gauge. Held to the right, the needle gives the quantity of fuel in the right tank—moved to the left, left tank fuel supply shows up.

Taxiing in the Bellanca requires a constant 45° arc movement of the nose as the engine cowling shuts off visibility directly in front of the plane. The pilot might reach forward while taxiing and pull the flap lever, which is located in an upright position beneath the instrument panel . . . just to get acquainted with its position and also to check them for operation. This is one practice personal-plane pilots using ships with flaps should acquire early in the game. Check them, same as you do your ailerons and elevator and rudder controls.

If the take-off is from a radio-controlled field, the pilot in the Bellanca and his passengers hear instructions from the tower over the GE loudspeaker (providing the engine has mufflers). This is a nice feature in the comparatively close quarters of a personal plane as it helps passengers observe a lull in conversation while the pilot lends an ear to tower instructions.

All the take-offs I made were with a slight crosswind. (The engine revved up to 2,500 rpm and the plane was airborne at 60 mph.) I enjoyed every take-off and landing I made in the *Cruisair Senior*. I found it an exceptionally easy plane to land or take off—two very necessary functions in flying any plane! In a heavy cross-wind the size of the auxiliary fins on the early 1946 and 1947 models is a contributing factor to a noticeable tendency of the plane to weathercock (i.e. the wind swings the tail of the ship around and the nose heads into the wind). I looked at a new tail assembly while at New Castle, Delaware, (Bellanca is getting it ATC'd) which I believe will do away with a large part of the weathercocking factor. Herb Venable, Bellanca's Chief Test Pilot, is highly pleased with the plane's improved stability with the new tail. It has a larger horizontal stabilizer area and very small auxiliary fins. The fins are there to keep the plane from spinning flat. In flight while testing stalls even from absurdly nose-high positions, I found the plane easy to handle and lacking any wicked traits such as snapping off on a wing.

Preferred climb is at the rate of 85 mph. With an *Aeromatic* prop, however, you whisk up and away from the runway at a neat 1,100 fpm if the air isn't rough. Rough air plays havoc with all flight figures—whether it's a military craft, a commercial plane or a lightplane. If immediate climb, which the *Cruisair* has plenty of, isn't the preferred

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"When you get lost this time, no alibis!"

walk" provided. When pulled forward, the door has a catch to hold it open against the wind or prop wash if the prop is turning.

The righthand seat beside the pilot has an adjustable back to assist entry into the rear seat. The fiberglass soundproofing is covered over by a gray upholstery material to match a bluish tweed covering on the seats. A pair of ebony control wheels mounted on shiny chrome control columns jut out from the panel. The panel background is a bluish gray to complete a tidy, pleasant and well-appointed interior.

Starting procedure calls for the pilot to check fuel shut-off valve and right or left fuel tank selector valve beneath the level of the pilot's knees (in a seated position). Both valves are out of sight but their relative position, once memorized, can be checked by slipping a hand over the valves (they are located one above the other). The lower, or the shut-off valve, should be straight up for open and the top valve's horizontal position serves to indicate whether or not right or left fuel tank is feeding . . . if pointing left, the pilot is flying on the left tank. Take-off may be performed on either tank and for safety reasons pilots should learn to choose the tank with the most fuel in it.

A key magneto lock on the panel is swung to both mags. The starter switch (with letter-



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AMERICAN AIRLINES



Delta
AIR LINES



Can I Carry A Boat?

(Continued from page 39)

Aeronca *Chief*, for example, will I have a wider choice of boats that I can carry? Or with a larger ship, perhaps an amphibian such as Republic's *Seabee*, what can I carry and still leave room for bedding, provisions and a light tent?" And so on.

From such contacts I believe many a sportsman, assuming he has the money—and a lot of them have—to buy the larger plane, will do so not so much for its speed and added comfort as for its ability to carry enough camping gear to make him independent of resort accommodations. This, in addition, of course, to whatever equipment his hobby demands.

So, considering a boat of some sort as a necessary part of the sportsman's outfit, let us see which types of craft among the many available are suitable for personal-plane carrying, not only in three and four-places but in the two-place and even the very small planes designed for individual transportation. By examining each type of boat in turn one can judge whether it will be suitable: not only as to its weight and compactability in whatever shape it must be carried but those other all-important features required of any boat—safety, seating and load accommodation, handling qualities, time required for assembly and disassembling for carrying, even the question of price.

Inflatable Styles

Although rubber rafts and boats have been on the market for years, it took the war and their record in it to really bring them to the notice of sportsmen. There is no doubt but that in this bracket one can find something light enough and sufficiently compact in packed form for carrying aboard a small plane such as a *Piper Cub*. However, there is more to the problem than "packed" size. Certainly in addition to lightness and compactability one must visualize actual use. If the boat or raft doesn't give the features ordinarily required of a boat, and is a nuisance to set up and take down and repack, it will not prove entirely satisfactory.

In buying a surplus product the point to be determined is whether you're being offered a raft or a boat. For although the terms have been somewhat generic in their application there is a difference. Rightly speaking inflatable rafts were made for emergency use aboard planes, whereas the boats were intended for more constant use. For the former, service, weight and packing space had to be kept to the minimum—fine for the service we have in mind here but meaning that they had to be built accordingly. They are not constructed, their manufacturers admit, to withstand much wear as on beaches, nor designed for frequent inflation and deflation and repacking. If this raft type with its minimum of weight and extreme compactability is the only craft that will come within a small plane's limited luggage load capacity, all you can do is figure the low price will likely offset its short life and that by giving it certain care, both in use and during periods of nonuse, its probable life can be lengthened. Inflating and deflating and repacking may be more of a nuisance than with other types but a raft will enable one to get about on the water, be perfectly safe to use and,

if you buy a style with rowlocks fitted or use a regular paddle instead of the hand paddles supplied with some of the very small rafts, it will be fairly maneuverable—although there will be little pleasure in its handling. A typical small raft 66 inches by 40 inches, may stow in a 15 x 13 x 4 (inch) carrying case and weigh (complete with its inflating device) about 6 pounds (or 12 pounds including the paddle). A two-man raft will weigh about twice as much, and so on. Price of a surplus product in new or reconditioned shape will run from \$20 to \$40 for the one-man size, up to \$60 for a two-man or larger raft.

Rubber boats, on the other hand, were designed for more constant use and were built as strongly as possible without losing sight of the need for lightness and portability. They were made of sturdier fabrics and reinforced by patches at points apt to receive greatest wear. Synthetic rubber and later Neoprene between two layers of reclaimed rubber-coated fabrics, materials that could withstand the action of oily water and strong sunlight, were usually used. Such a craft, providing you can get one light enough to come within your plane's carrying capacity, is a much better buy than the raft. As surplus products they are not as common as the raft type, and as the terms have become so mixed in their application, the difficulty may be to determine what you're being offered—a boat or a raft. The color can be considered a fair guide. The rafts were usually orange-yellow, often with blue bottom to minimize shark attraction, whereas the more durable boats were nearly always dark or dun colored.

If a plane's luggage capacity permits considering a slightly heavier craft, one can avoid any chance of going wrong by choosing one of the inflatable boats now being offered by several of the manufacturers who turned out the wartime rafts and boats. These light and portable (from 17 pounds up) boats are constructed to withstand hard wear and are designed for easy inflation, deflation or repacking. The hull shape of most boats insures easy handling so that actual use will be a pleasure. Safety features are incorporated. Although each manufacturer has his particular construction, the main point is that all are built for actual use as well as for carrying. The outer shell will be a heavy—perhaps plastic treated—

fabric that is waterproof, sun-resistant and strong enough to be almost snagproof. This will enclose the air cells, usually two, each buoyant enough in itself to support any likely load in the event of one's being punctured. These cells will be in some easily replaceable form such as heavy-duty inner tubes. Inflation usually is accomplished through twin positive-action airvalves using a handpump which is supplied. The hull form—the bow slightly raised and bluntly pointed—is easily maneuvered with a paddle or, since fabric rowlocks are attached, a pair of jointed aluminum oars. A light bracket for a small outboard can also be supplied as an extra. This is a feature worth considering for, while it may not be practical to carry a $\frac{1}{2}$ to 2-hp motor in the plane, there may be opportunities for using one—at resorts, for example, where one can be rented and, of course, in general use of the boat in home waters. A one-man size in a representative make, 6 feet long with $3\frac{1}{4}$ -foot beam, will weigh around 17 pounds for the boat alone; a two-man size, $7\frac{1}{2}$ feet by 4 feet, about 22 pounds, and a three-man size 30 pounds. In each case the weight of the grip-size carrying case, in which the boat packs compactly, and of the jointed oars and the pump must be considered, adding around 8, 10 or 14 pounds according to the size. Prices run from \$45 to \$70 depending on size.

Collapsible Types

Boats of this type are characterized by their ruggedness and by the ease and speed with which they can be set up and taken down, also by their rigidity in use when handling qualities compare with what a regular canoe or skiff affords. In the smaller sizes they come within the carrying capacity of the medium-size plane. A 10-footer with 36-in. beam, in the sharp stern canoe model intended for paddling, weighs 45 pounds and folds to 60 x 8 x 8 (inches). A rowing model—the same length and beam but with a square stern adapted for outboard use—weighs 60 pounds with the same stowage space required. Time required to set the boat up or take it down is from 10 to 15 minutes. This type has, over a long period of years, built up an enviable reputation for withstanding hard usage, and the prices asked, around \$48 and \$65 respectively, are attractive—especially so when one considers the years of service that can be expected.

Kayaks of the folding type should be considered in this bracket too, for they are comparable in weight and price and require about the same time to set up or take down. Either a 14-foot 40-pound single-seater or a 16-foot 50-pound two-passenger kayak generally will provide the same usage associated with collapsible types.

Folding Boats

In this true folding type, the boat folds instead of collapses and the bundle is long and slim, usually the length of the boat, rather than short and boxy. The usual weight is around 80 pounds complete with oars for a $9\frac{1}{2}$ -foot square stern, sharp-bowed skiff with 39 inch beam, and the folded size of 10 feet by 15 inches by $5\frac{1}{2}$ inches, will be out of the question for the smallest planes. But the owner of a ship such as the *Stinson Voyager Station Wagon*, for example, may find the extra weight



RUBBER LIFERAFTS are suitable as light boats, and can be carried in some planes

Can I Carry A Boat?

("extra" as compared with other types of this type of boat) justified by its rigidity and good seating and load carrying capacity.

Sectional Types

A prominent Canadian canoe builder makes, usually to order, a sectional canoe designed to be carried on the under side of a plane. While this type is frequently seen there aboard government forestry department and other planes, I know of no similar canoe made here. We do have several makes of sectional skiffs, usually three sections designed to nest inside each other for carrying, and their weight of around 90 pounds is comparable with the 100-pound weight of the Canadian sectional canoe mentioned but the carrying form is not convenient for stowage and the weight is high.

A recent presentation using a new material and entirely different form of construction offers advantages not only in compactibility but also in weight. It is worth considering by the owner of a plane large enough to carry the 65 or 70 pounds involved. This type is of interest here too because it has been brought out by a plane manufacturer familiar with the problems involved. Available in either a double-ended canoe or in a sharp stern skiff model, both 14½ feet long, its 10 sections of molded plastics are secured together by the simple system of clamping. With a sheath of stout waterproofed fabric drawn over it and fastened (the whole process is claimed to be but a 10-minute job) it gives a perfectly

rigid craft and one with the handling qualities of a solid type. Some sportsmen will prefer the canoe model for its grace and interest of handling, others favor the skiff because of its more comfortable seating accommodation and good load-carrying capacity. The weight of either—65 pounds for the canoe, 70 pounds for the skiff—is not excessive, indeed is low if we consider their 14½ foot length. The two luggage-like bags into which either model packs are fairly compact bundles for carrying.

Solid Types

I am frequently asked if some solid type of boat or canoe may be used. Readers point out that new light forms of construction such as plastics or molded plywood, aluminum or other lightweight alloys, and so on, are permitting manufacturers to turn out boats easily as light in weight as the types we've been considering here. I believe, from my contacts with plane manufacturers, that the shape and bulk rather than the weight of such a craft invariably rules it out. Carrying would undoubtedly be dangerous and would be hard on both plane and boat.

In the end, the limitations as to weight and packed size imposed by the particular plane in which the craft will be carried will naturally govern the type to be bought. All the types mentioned here have proved themselves in use on the water: each has, although in varying degrees, the features ordinarily required in any boat—rigidity or supple strength and sufficient seaworthiness to insure confidence and safety, maneuverability with paddle or oars, and freedom from leakage or constructional failures.



Angler's Holiday

(Continued from page 36)

that very afternoon. As soon as Thompson brought the Cessna to a gingerly three-point landing at the Guaymas airport, we hurried to the hotel to make the necessary arrangements. We got an Elko cruiser and Pedro, a fishing guide. We clung to Pedro. He was our promise of those coveted pictures in which you lean casually on a 150-pound fish.

The first day out we saw the biggest fish landed in the history of 1946 Guaymas fishing. It was a 293-pound tuna. We did not catch it. Howard Ferris of Monrovia, California did. We watched the whole procedure, with the game fish fighting it out like the mad and wild thing that it was—jumping clear of the water, sounding, then coming up again, jerking at the line, straining it to the last inch of its endurance. By the time Ferris landed it we were as exhausted as if we had done it ourselves. I took his picture near the fish, then started to hand him my camera, but thought better of it. A look in his eyes warned me that the only way he would see me photographed next to his fish was with a harpoon through my gills.

The first day was not too successful, fish-wise. But wait, we argued, till we went out tomorrow. The second day we started out at daybreak, just the four of us and Pedro. By midday Louis declared it was too hot, and the whole idea was too strenuous for a guy whose most vigorous sport for years had been turning over in bed. The girls fished in grim silence. Nothing was happening. Between us we decided that was bad for their morale.

(Continued on page 62)

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Sportsmen's shows—
or write for the name of
the nearest dealer

Here it is...THE SECTIONAL SQUARE STERN LINKBOAT

The boat you can take with you. It's an outboard—It's a sailing dink—It's a practical row boat—yet it is easily stowed away in an automobile or plane to be carried anyplace—anywhere there's water and assembled in ten minutes. Weight 79 lbs. ...length 11½ feet... beam 42 inches... competitively priced.



Dept. SK-1

LINK AVIATION, INC.
Binghamton, N. Y.

Weather By Radar

(Continued from page 17)

echo depends upon the total mass of water present and the size of the individual water particles. Therefore, the more moisture-laden the atmosphere, the stronger the echo. This immediately offers an aid to determining qualitatively the severity of a storm—the brighter and more distinct the echo the more violent the storm. It must be emphasized, however, that the physical processes that cause meteorological echoes are not yet completely understood.

The size of the individual drop becomes increasingly important as the frequency of the radar is raised. In the higher frequencies, the radar pulse is less able to penetrate a mass of moisture, and will therefore detect weaker storms (smaller moisture density) more easily than a lower frequency radar. However, the lower frequency sets, due to greater signal strength and better propagation characteristics, have a greater range and can detect storms at greater distances. Thus, for general-purpose storm detection, the long-range S-band sets of the early warning type appear to be better suited than X-band equipment. S-band equipment ranges from 1650 mcs to 5200 mcs, and includes the versatile SCR-584 and SCR-545 sets. The X-band sets range from 5200 to 10,900 mcs.

Meteorological echoes differ from solid echoes in that they constantly change in size, shape, and intensity. Groups of echoes may join, break up, and rejoin as they travel across the circular PPI scope (Plan Position Indicator). On the upright A-scope the echo is one of rapidly changing signal strength and resembles static (or "grass").

Clouds from which fall light, moderate, or heavy rain, sleet and snow, and occasionally non-precipitating clouds such as heavy cumulus, will give echoes. Stratus and fog cannot usually be detected on S-band radar.

It may be said that storm types detectable by radar are: Showers, squalls, and thunderstorms; cold, warm, and occluded fronts; typhoons, hurricanes, and tornados.

Ranges at which these storms can be detected depend upon the height of the storm above ground, and the power and range of the radar. In general, surface radar is effective as follows: Storms extending 5,000 feet can be detected from only about eight miles; of 10,000 feet, from 120 miles; and from 20,000 feet, up to 175 miles.

With airborne radar ranges greater than those indicated above are possible. For example, the widely used AN/APQ-13A (10,000 mcs) can obtain a range of 200-350 miles. For cloud detection of a general nature high-powered, long-range S-band sets offer the best combination of detection and range characteristics, though other radar sets now in the developmental stage may prove even more useful in storm detection.

Cloud echoes may be distinguished by their motion, shape, size, elevation and range of detection, and intensity of echoes. These characteristics serve to identify the following:

Cold fronts—usually recognizable by the outstanding brightness of their echoes and their more rounded and solid appearance. An active cold front is easily located on a radar scope as a line of cloud echoes.

Warm fronts—echoes are indistinct, usually covering a wide irregular area of the scope.

The echo shape varies continuously, indicating changing areas of precipitation.

Thunderstorms—because of their great height can be detected at ranges up to 100 miles. On the PPI scope they show up as a bright, dense central area having an indistinct margin. An individual thunderstorm usually covers several square miles.

Showers and squalls—echoes will appear less distinct than the thunderstorm echo, and will not show up at such great ranges, being at less height. The echoes will usually be scattered at random over the scope.

Typhoons and hurricanes—the most interesting and easily identified type of weather phenomenon. The cloud pattern forms in a spiral around the eye of the storm like a giant revolving nebula or pinwheel. If the radar range is not great enough to include the eye of the hurricane, the singular whorls and circular shape of the cloud pattern are unmistakable.

Radar weather forecasting is useful to anyone interested in advance weather informa-

tion than could be obtained from surface reporting stations. Three MEW radar sets located precipitation areas over an area of 80,000 square miles. Improved location of radar equipments would have increased their usefulness considerably.

2—The radar weather message indicated the existence of showers in areas where no other form of observation was available.

3—Radar created, in effect, a dense network of observing stations.

4—Radar weather messages gave useful information about the precipitation associated with cold fronts. However, the exact location of the front remained a meteorological problem since the precipitation was sometimes ahead and sometimes behind the front. More extensive radar coverage would yield more detailed data on cold fronts.

5—The start and end of precipitation was forecast on occasions to within one hour.

6—All storms which were a hazard to aircraft were detected by radar.

7—Radar weather messages were particularly useful at night or when visibility conditions were so poor that storms could be detected only on radar.

8—Scattered storms which caused unnecessary delays in airline operations could be evaluated by radar, enabling some flights to proceed on schedule.

Every one of these applications is based upon meteorological echoes seen on existing equipments. The conclusions indicate accurate forecasting to an extent not now attainable with ordinary weather reports.

The Navy has installed special equipment for radar storm detection at Naval Air Station Lakehurst (N. J.), NAS Corpus Christi (Texas), and the Marine Corps Air Station at Cherry Point (N. C.). The Army Air Forces operate a Radar Storm Detector set in connection with the Weather Station at Andrews Field (Md.) in the Washington area, Hq. of the Strategic Air Command. This is an APO-13A, and it picks up direction, movement and height of cumulonimbus clouds, intensity of rain showers, and is capable of determining within five minutes the weather change at its present station. A "Rarep" (radio report) goes by teletype to all weather stations. The AAF Weather Service is currently procuring 85 microwave radar sets for storm detection purposes, to be installed at bases in the United States and overseas. A weather reconnaissance program for detection of storm areas is already in operation with radar-equipped planes going out daily from West Palm Beach (Fla.), Merced (Calif.), Newfoundland and the Azores. These planes follow storms, observe their direction and rate of movement on radar scopes, and radio the information back to weather bases where it is used for military weather forecasts and for providing observational data to the Weather Bureau, which serves the general public.

Use of radar storm detection techniques by pilots and weather forecasters will unquestionably result in greater safety to aircraft, more accurate and timely warnings, and in minimizing property damage by destructive storms. In offering an actual picture of storms within a definite area, in enabling the length, depth, height, intensity, speed and direction of such storms to be analyzed, and in supplying information on the upper winds, radar has only begun to prove its value in the expanding science of short range weather forecasting.



BLACK WIDOW, equipped with airborne radar set, charts hurricane course and relays warning to weather station network

tion. It is more accurate and reliable than ordinary weather reports, as a PPI presentation offers an actual picture of storms within the range of the set. With a little practice, this picture can be analyzed into length, depth, height, intensity, speed, and direction of any storm in the area.

The pilot of an aircraft can avoid flying into bad weather, which is particularly important at night or in low visibility. He can find the best course through severe cold fronts or through a large area of squally weather, and get advance warning of severe storm conditions and "closing" airports.

Aerologists can use radar to furnish homing courses to planes in the air and find the wind direction and velocity by noting the movement of echoes across the PPI scope. They can predict almost precisely the time of approach and duration of individual storms, and give timely warning to secure flight operations as much as four hours in advance of the approach of destructive phenomena such as fronts, squalls, thunderstorms, typhoons, and tornados.

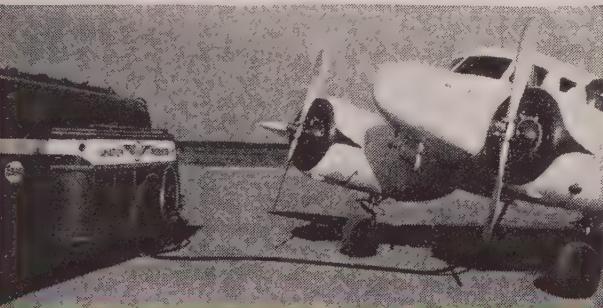
Three MEW (Microwave Early Warning) radar sets were established by the Canadian Army Operational Research Group to test the usefulness of radar in weather forecasting. These MEW stations were set up in Canada at Montreal, Ottawa, and Clinton. Some of the experiences and observations are summarized below:

1—Radar weather messages gave a better picture of the extent and location of precipi-



America's First Air Ambulance Service Picks ESSO

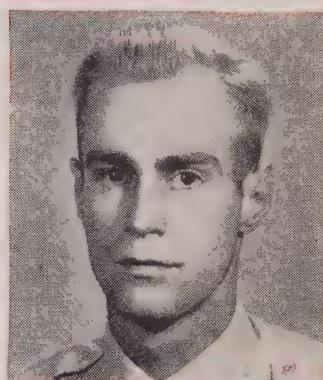
Boyd L. Ticktin and Jack W. Hunter, Durham, North Carolina, have formed the first CAA-approved Air Ambulance Service in America. These two aggressive Air Force Veterans are presently serving the Eastern U. S. from Massachusetts to Florida and west to Chicago and St. Louis . . . and flying with their fleet of white Cessnas are Esso Aviation Products!



Air Ambulance refueling with dependable Esso Aviation Gasoline.



BOYD L. TICKTIN



JACK W. HUNTER

Mr. Ticktin, President of Air Ambulance, Inc. writes:

"We wanted dependability of equipment and supplies. To assure that dependability in fuel and lubricants, we chose Esso Aviation Products.

At the home field and elsewhere we rely on Esso Products and efficient service for our modern flying ambulances.

Your company has been one of the pioneers and leaders in aviation ever since you fueled the first flight by the Wright Brothers here in North Carolina in 1903. We, too, are aviation pioneers—first with Air Ambulance Service. We are glad to have you associated with us in the public service we are rendering."

TO BE A VALUABLE AID in any aeronautical endeavor is the first job of Esso Aviation Products. With constant product quality, never-ending research, and friendly, efficient service, the Esso Wings serve American aviation!

YOU CAN DEPEND ON

ESSO

AVIATION PRODUCTS

SOLD IN THE 25 STATES INDICATED



AAF Reserve Program

(Continued from page 19)

Few men can afford to take time from their civilian work to meet these requirements.

At the present time in the Reserves, 15 days active duty with pay is authorized each year. The balance of the time spent is budgeted by the man himself according to his own convenience. Correspondence courses are now available which allow him to study at home if he wishes to advance more rapidly. Pilots receive a minimum of 80 flying hours a year, using AT-6's, AT-11's and P-51's. Later, a certain number will go on to instruction in jet jobs and to B-25's and B-29's. Aircraft and maintenance personnel will get training on the same types of planes and flight crews will be given sufficient time in the air to maintain their proficiency. All categories of non-rated personnel are to be given consideration for training in their specialized fields, using both aircraft and synthetic training devices.

The extra dividends are obvious. If you don't have a job in aviation now and you let yourself get rusty on "know-how," there will be somebody else who will get that coveted place when the industry really gets into gear and the jobs open up. If you are working in another industry or business but keep up your skills in aviation, you have an extra string to your bow in time of need.

I talked with a group of Reservists recently at Andrews Field, just outside Washington, D. C., and they were pretty emphatic about two other advantages they saw in the program. T/S J. R. Carter, air engineer, put it this way: "When the war started, I tried every way I knew to get into the Air Forces. Instead, I spent eight months in the infantry before I could get a transfer. I ended up with the Seventh Air Force in the Pacific, ferrying P-61's from Hawaii to Iwo Jima, Ie Shima and Manila. When I was discharged, I got a job with the people who build the *Ercoupe*. The Army taught me everything I know about aircraft. If you know one plane, you really know them all. This training is free; it's swell and the Army has the best equipment there is. The Air Age is here to stay and I want in!"

"There's another angle, too. We can't tell just what is going to happen. If we have to get into another war, I figure on being ready to do the kind of job I like to do and not have to go back to being a doughfoot. We're getting all this free now—if we get paid for the time we spend, it will be super. I'm working now for an A and E license because I want to stay in aviation. That takes a long time because of CAA requirements. Anything I learn in the Army can be applied on any other education I want to take, so that's more velvet."

S/S J. P. Stanfield of St. Louis, Mo., ex-paratrooper, who worked on the Strategic Bombing Survey, is enrolled in the Administrative courses. He was caught by the infantry, too, and didn't like it. Now that he's a civilian again, he's going to college but he thinks the administrative courses the Reserve gives him will help him in business. "I've talked to a lot of the boys," he said. "Some of them want to go into the Navy Reserve because they are getting paid now. But I like the Army because I know it. Every man has his own idea but nearly all of us feel we'll get a better break in case

of another war, with back pay and seniority accumulated if we've been in the Reserve. It's the best way to get a chance at OCS and a commission, if you want that. And we have a lot of fun, too. A lot of men would come in if they knew more about it."

The officers with whom I talked formed a pretty fair cross section of Reserve thinking and types. They were: Lt. Col. Robert G. Carnahan, from the Eighth Air Force in the Pacific, now with the Safety Bureau, CAB; Capt. Richard C. Morauer, Eighth Air Force in England, a student at Maryland University; 2nd Lt. Paris Keriakoo, Central Flying Training Command, a student at George Washington University; 1st Lt. Morton Mantell, 54th Troop Carrier Wing ("Tokyo Trolleys"), also at George Washington; and Capt. John H. Llewellyn, 383rd Group (B-29's), who flew in the mining operations from Saipan to the Japanese coast and is now a salesman.

There wasn't any question in the minds of these men as to why they were in the Reserve. "Flying costs money—big money. You get rusty in a hell of a hurry. Now we can get a lot of time on good ships and it doesn't cost us anything. Some of us wanted to be airline pilots and were turned down because we didn't have enough hours even to be copilots. Maybe we can't build up the extra time this way very fast but at least, we're going in the right direction and we're flying. We'll keep ourselves abreast of new developments and have a chance to learn the new stuff as it comes along. If there should be another war, we'll be ready and we can take a lot better care of ourselves than we could if we were green. Survival for trained men is a lot easier than for the ones who don't know what the score is. Promotions come faster—look at the guys who were called out of the Reserve when this last war started. They hadn't had nearly the chance we've got to fly but they're the ones who usually ended up chicken Colonels or Brigadiers. It paid off. Then there's the business of protecting Uncle Samuel—we don't talk much about that but we do think about it. We saw too much of the other stuff overseas, and we didn't like it."



AAFR Kenneth Keene, with approval of Mrs. Keene and son, flies on weekends

The War Department says that this thinking is typical of the men who have joined the Reserve all over the country. They all feel that their buddies should know more about the program. So, fellows, here it is in a nutshell. Let's start with a statement made to SKYWAYS by Lt. Gen. George E. Stratemeyer, C.O. of the Air Defense Command, with headquarters at Mitchel Field, under which the Reserve comes. General "Strat"

says: "The Air Reserve program has indeed come a long way since its humble beginning on July 1, 1946, when actual flying by Air Reservists began at Memphis in an aircraft borrowed from the 4th Ferrying Group. As of December 1st, five months later, 96,772 flying hours had been logged. Air Reserve pilots are now flying at 63 bases in the country at the rate of 10,000 hours per week."

"The figures are most significant as they indicate maximum effort, cooperation and efficiency both on the part of our Regular Air Force officers and enlisted men administering the program in the field, and exemplary volunteer performance of Air Reservists.

"But the Air Reserve Program is well started on just one phase of its development—the flying phase. In order to create an Air Reserve that will be ready for action when needed, we must supplement these flying activities with complete combat and service-type Air Reserve units without delay. The success of this next step depends entirely upon the participation of additional non-rated officers and enlisted men. The contributions of these individuals will determine the development of our Air Reserves into a useful force."

Up 'til now, the program has been working under a handicap in that it has had to organize and train at the same time. Final organization is expected to be completed by July 1st of this year, with organization and operation of 51 Air Reserve Groups as the final step. These will include Very Heavy Bombardment, Light Bombardment, and Troop Carrier Groups, and Night Fighter and Reconnaissance Squadrons. The 19th VHB Wing has already been activated at Birmingham, Alabama, and the 302nd Troop Carrier at Marietta, Georgia. Training is done by Regular Army Air Force officers and men but the entire personnel of the Reserve units is drawn from the Reserve itself. Former Army Air Force flight officers can request appointments for commissions in the Reserve, since there is no such status in the peacetime Air Force.

During the coming summer, the success of the authorized 15-day active duty training period with pay and travel allowances will depend on how rapidly and thoroughly the outfits are organized. The AAF wants to conduct this training by units, just so far as it is possible to do so, assigning them to stations where Regular Air Force units of the same type are located. This plan applies particularly to the very heavy bomb squadrons, which make up a large portion of the Air Reserve but which cannot be supplied with their standard equipment for the year round training on the B-29's.

As of December 1, 1946, the latest list available at the time of writing, the following are the Air Reserve Training Bases active (as of December 1, 1946):

FIRST AIR FORCE

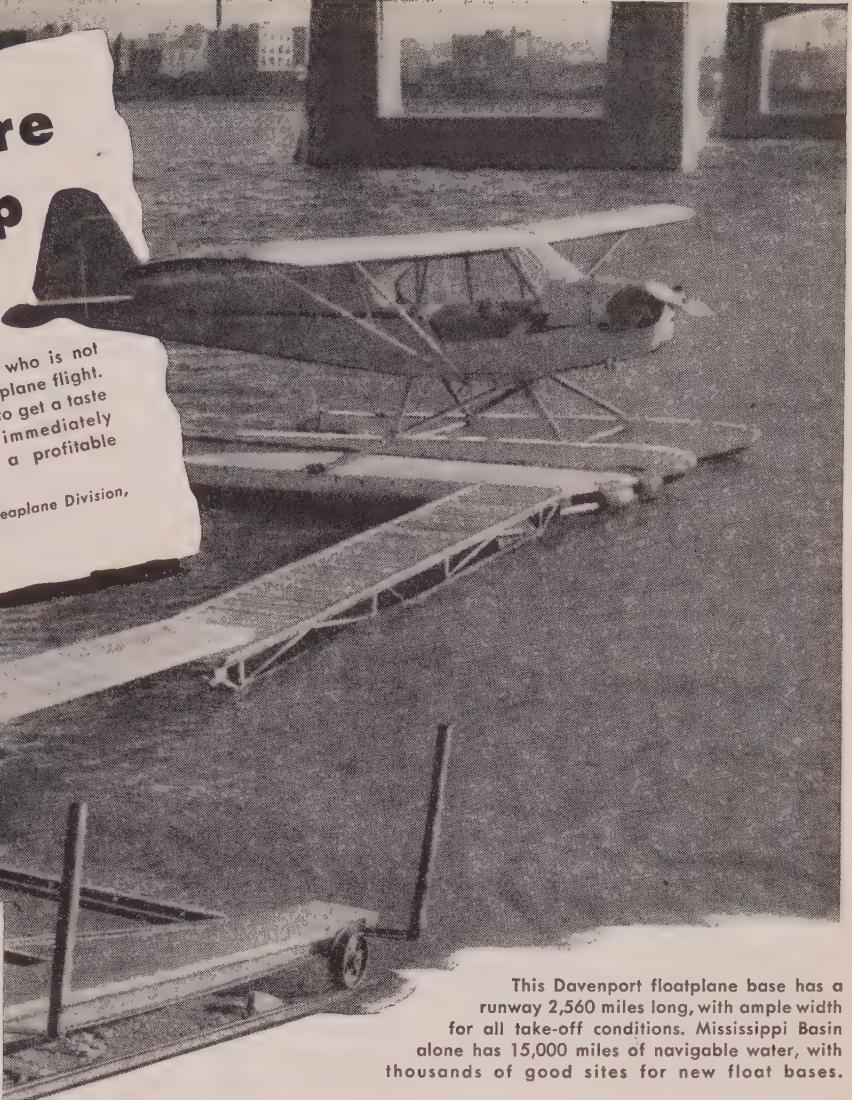
Major General Robert W. Douglass, Jr.,
Fort Slocum, N. Y.
Westover Field, Chicopee Falls, Mass.
Dow Field, Bangor, Maine.
Grenier Field, Manchester, N. H.
Rome Army Air Field, Rome, N. Y.
Mitchel Field, N. Y.
Newark Army Air Base, Newark, N. J.
Stewart Field, Newburgh, N. Y.
Niagara Falls Airport, N. Y.
Bedford Army Air Base, Mass.

(Continued on page 66)

"FLOATS are building up our trade"

"We have yet to find one person who is not highly enthused after their first seaplane flight. And pilots new and old have only to get a taste of seaplane flying and they immediately become 'web-footed.' There is a profitable future in floats."

—Don Herman, Manager, Seaplane Division,
Elliott Flying Service
Davenport, Iowa



This Davenport floatplane base has a runway 2,560 miles long, with ample width for all take-off conditions. Mississippi Basin alone has 15,000 miles of navigable water, with thousands of good sites for new float bases.

INLAND BASES MEAN MONEY—Where the Mississippi cuts through the heart of America's "tall corn" region, the Elliott Flying Service has introduced float flying to the Middle West. The results from a \$600 installation: a steady volume of new business and a surge of renewed interest among pilots bored with landplanes.

As distributors both for Piper aircraft and also Edo floats, the Elliott firm is aiding other towns up and down the river in setting up float bases. They are building future plane and float sales. It's an example for all distributors to study. And the entry of this company into the float field demonstrates the ease with which any operator can tap this profitable flying market.

OTHER OPPORTUNITIES INLAND—There are many states where floats are still new. Since they give real fun in flying, floats are the answer to lagging interest among present landplane pilots. Facilities required for float flying are simple. Nature builds the airports; you merely have to add a dock or ramp.

WRITE TODAY . . .→
for these FREE booklets.
Details of float flying,
bases, construction and
Edo-equipped planes.
Just send a postcard or
letter.



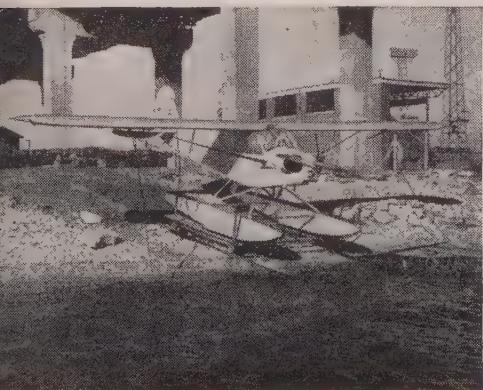
EDO AIRCRAFT CORPORATION

200 Second Avenue

College Point, Long Island, New York

Float flying acceptance was quick and enthusiastic when introduced in Iowa. Response was especially strong among many pilots who found a new interest in flying, due to the fun and utility natural with floatplanes.

Almost in the outfield of the local ball park, the Davenport Seaplane Base shows a main advantage of floats. Bases can be located right in the heart of a city, where they draw more crowds than suburban fields.



Shutterbugs

(Continued from page 23)

has mushroomed into a major aviation industry since the war. Aerial contractors who bought AT-11's for mapping got action on their money a lot quicker than those who bought C-47's for passenger hauling.

Thus it is, after 25 years of starvation and leading a despairing barnstorming life, the aerial mapping photographer has finally come into his own.

Mapping is done on contract. Some contracts call for negatives only. Others want finished mosaics, still others call for engineered and drafted maps. Contracts have paid as much as \$15 per square mile and as little as \$3, depending on how tough the job was to fly.

Even at top prices the government agencies, oil companies and big mines have learned that the aerial map is the best, the quickest and the cheapest means of surveying any given terrain, and all agencies charged with problems involving contour and vale have come to accept the aerial map as the final answer to their problems.

And, it's the men who make the first step—making the negatives in a frozen world of blue at 24,000 feet, with the greatest speed and accuracy—who also make the royal share of the profits. It's tough, but safe. You fly in sunny weather always—9 and 10 hours a day on oxygen, until nerves and tempers get so strained that the best of friends have been known to leap at each other's throats.

Aerial mapping has always been a tough and competitive field. Legitimate companies are numerous. Some of the best known are Fairchild Aerial Surveys, Los Angeles, California; Jack Ammann Photogrammetric Engineers, San Antonio; Edgar Tobin Aerial Surveys, San Antonio; Aero-Service Corp., Philadelphia; Woldz Studios, Des Moines, Iowa; Aero-Exploration, Tulsa, Oklahoma; Robinson-Stanدار Aerial Surveys, Newark, N. J.; and several others, smaller outfits that exist primarily by sub-contracting on a freelance basis.

Once there were more than 50 companies. In 1937 the Department of Agriculture started an extensive program to let out contracts for the mapping of soil-erosion control areas, and many fly-by-nights blossomed suddenly around the honeyed source of money. Some of these companies were no more than an ambitious pair of adventurers with an old Cessna *Air-Master*, a battered camera and no oxygen at all.

Mainly due to poor management, lack of trained crews and insufficient equipment most of these aerial mapping companies folded up until by 1941 there were only 13 main outfits still in the game. The war and its tolls cut this down quite a bit.

Naturally, the business has held men through the years and aerial mapping has its deans as all other phases of flying do. They are a specialized breed of men, like racing pilots, test pilots, air line pilots, dusting pilots, and so forth.

Among the best known are men like C. E. Cheney, who started flying in 1928 for Tobin; Bob Calthorp, formerly of Southwestern Aerial Surveys; Tom F. McRea, of Woldz before the war, and since associated with Ammann; Glenn Messer, a former Hollywood stunt pilot and World War I ace who has been flying for 35 years and now

works mostly for Woldz; and some 50 others who have been in and out of the game and done both military and commercial mapping.

Typical of the best in an aerial mapping team is the Rodriguez brothers from San Antonio, Texas. They are Joe, the pilot, and Homer, the photographer, who fly a reconverted AT-11 for Jack Ammann Photogrammetric Engineers. Between the pair of them they have photographed more than a quarter-million square miles of the earth's surface, and they have taken pictures of every state in the union.

In addition, Joe has flown photo ships north of Point Barrow at the northernmost extremity of the American continent and south of Cape Horn, 250 miles below the Straits of Magellan at the lowest tip of South America. He has flown photographic missions over Death Valley, the lowest level, and over Mt. McKinley, the highest, in North America. He has photographed one of the smallest centers of population in America (Silver City, Idaho, Population 2, at the time) and some of the largest in the world.

During an excellent month of weather and work, the Rodriguez brothers have managed to photograph nearly 12,000 square miles of territory and on single days have run as high as 1,200 square miles, on some rare occasions turning in as much as 1,000 square miles of mapping without a "reflight"—that is, an error of pilotage or photography that requires a section to be done over. But to do it, these boys worked for years getting the background and experience.

Teamwork is more important here than in college football. Even the best of friends become bitter enemies under the strain. Cameras have been thrown at pilots and oxygen tanks at cameramen . . . strange things happen when you are high and on oxygen. Crews have spent hours in the torture of cold skies, working hour after hour on a tough job, only to find that they drew a blank—forgot the dark slide, left the lens cap on, ran out of film midway, got lost and worked at right angles to the territory, have had shutters freeze at 30 below zero or just don't have pictures to show for the work done.

Sometimes a good pilot loses his sense of perception at 24,000 feet and gets lost over familiar ground. Yes, sir, perspective is screwy all the way around in this business. A team stationed at Bryce Canyon in Utah, for instance, might be flying pictures down be-

low the Grand Canyon in Arizona. When Joe and Homer were in Ogden, Utah, flying from the hangars of West-American Airways, they were mapping over Gold Hill, Nevada, 150 miles away.

The climb for altitude explains it. They climb their AT-11 at 120 to 130 miles an hour and reach working altitude in 45 minutes. They might as well climb straight out as circle, so they pick their base for practical purposes.

Flying from 18,000 to 24,000 feet high the twin-engine Beechcraft uses fuel at about 36 gph with throttles wide open and 15" Hg. (inches of mercury) giving 1,900 rpm for an indicated speed of 120 mph.

They have a low-pressure oxygen system that loads up to 400 pounds and provides them with 120 cubic feet of gas, a 12-hour supply. Getting oxygen in the field is easy—they buy it in high pressure tanks from welding suppliers and change it to their system by a special valving device they carry with them.

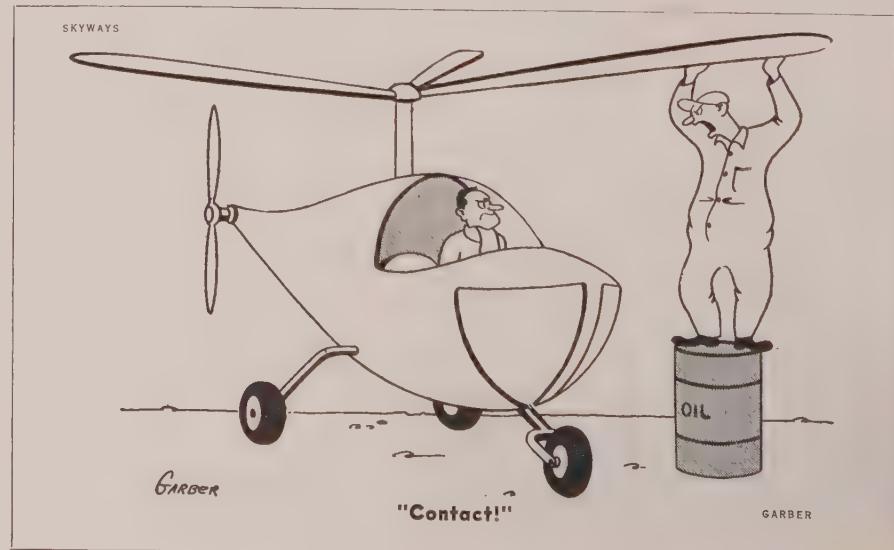
An occupational hazard of the business is a strange counterpart of the "bends," which comes from increasing pressure too fast, instead of the other way around. When you've been up high on oxygen for hours, too rapid a descent will make you one sick Indian for days on end. They say it is the very worst of hangovers.

During the long days of summer the boys can take pictures for nearly nine hours, sometimes more. Normally they use two and a half to three rolls of film a day. The film is 180 feet long, 9 inches wide and takes 210 negatives that are 9 inches square. Each exposure covers nine square miles at 14,000 feet above mean terrain, but contracts require a 60 per cent overlap along the line of flight to allow for tiltage and misses, so they fly a 30 per cent overlap on each strip laid side by side.

Time was when high winds, met at altitude, occasionally grounded a crew on otherwise perfect days. But the faster and more powerful AT-11 makes it possible to fly good missions irrespective of wind.

Each night the exposed negatives are sent air express to the Jack Ammann labs in San Antonio where a skilled crew will finish the job, delivering a completed map on some contracts, the printed pictures on others. When a line has drifted off, a recon strip is hastily assembled at the plant and air-

(Continued on page 56)





Continental Motors Corporation
AIRCRAFT ENGINE DIVISION
MUSKEGON, MICHIGAN

SKF
BALL AND ROLLER BEARINGS

Scarfab

JM
JEWELL

Weston Instruments

Weatherhead

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RANGER
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LONGINES-WITTMAYER
CHAMPION
SPARK PLUGS



Everything for the Flyer

This is a sign you will see at an ever-increasing number of airports across the country. Where you see it, you'll know that a million-dollar inventory in parts and supplies, and the country's finest overhaul and maintenance facilities, are at your command.

'Til then, *everything* you need, whether you fly a trainer or a fleet of transports, is immediately available at the many Pacific Airmotive Major Bases, located from Alaska to Mexico.

They are ready now to supply you with the same *all-inclusive quality-service* they provide for military aircraft and the Nation's leading airlines.

Service Operators: Inquire now about the new PAC Dealer Plan. If your firm qualifies for it, you will be able to serve your customers better and faster with aviation's largest and oldest service and supply organization behind you ...and with a minimum investment for inventory and facilities. Write today.



PACIFIC AIRMOTIVE *corporation*
EXECUTIVE OFFICES: 6265 San Fernando Road, Glendale 1, Calif.
AND ITS AUTHORIZED SALES AND SERVICE DEALERS

Shutterbugs

(Continued from page 54)

mailed to the crew so a reflight can be made at once. The reflight is the bugaboo of the business, but modern equipment makes it easier to do and gives better first-time performance, thus eliminating re-takes.

Common errors that cause reflights are lack of border coverage, improper crab correction, camera tilt, improper interval, improper alignment, clouds between camera and ground, incorrect exposure and improper scale—or wrong altitude above ground.

From the time the Rodriguez team first got together, Homer, the cameraman, in photographing nearly 25,000 square miles, has not been responsible for a single reflight error.

All governmental agencies get the use of maps flown for any one department, so there is no overlapping of work by different agencies. Some regular customers of the aerial mappers are the Department of Agriculture, the U. S. Forest Service, the War Department, the Department of Interior, the U. S. Engineers, state highway departments, oil companies and other industrial concerns.

The face of the nation is a known factor to the old time mapping pilot. He comes to know the whole United States of America as you know familiar landmarks in your own town, such as the Empire State Building, or Seeley's Slough.

He learns to know the nation's weather, too, for his job depends on good weather and when it is bad he watches it carefully. He finds out how the seasons affect the flying weather in various sections and knows which months of the year to spend in which section of the country.

It's a gypsy fling of a life, but the pay is good, even if his own kids run and hide when "that strange man comes in the house."

An average base pay will run from \$220 to \$500 a month, depending on the company and the quality of the team, or crew as they are commonly called in the business. An additional bonus is paid of 10 cents per mile and is standard for all major companies. Joe and Homer have found it possible on some days to make as much as \$100 bonus.

To do that they fly nine hours of 30 to 60 degrees below zero weather on oxygen, but both seem physically constituted to thrive on those rigors. Neither has any desire to start contracting for himself, preferring to work as a crew. It is a tough racket to crack, they aver, unless you've got a lot of dough.

The mere fact that it is all good weather flying has kept fatal accidents to a single instance in the commercial field. Once off the ground you go for altitude and always have a long way to glide if emergencies arise. Also, when it fogs up, you land.

Where the old airmail pilots have had to fight for life trying to beat the weather, the old mapping pilots have gotten calloused sitting around hotel lobbies or convenient bars, while the snow flies along the airways.

That brings up the final attribute needed for a contented and successful mapping pilot—patience. Patience to sit for days while the rain falls steadily, and enough optimism to retain the conviction that the law of averages is going to give you 120 days a year to make your living in, and if you're plenty good and have a first-class partner, it will be a pretty good living at that.

Bellanca

(Continued from page 46)

maneuver, the pilot can register a fast 95 mph on the airspeed indicator and settle for a 650 fpm which at 2,300 rpm will carry him speedily on his cross-country trip. Once airborne the pilot turns to the task of rolling up the gear by a manual crank located between the pilot and co-pilot's seats. If flaps are used on take-off to shorten the run the intermediate setting is best. A pilot should slow-flight a *Cruisair* with full flaps (46°)—up about 2,000 feet to get the feel of the ship before he tries take-offs with flaps.

With the fixed-position prop, cruising speed is an indicated 142 mph. The use of the automatic prop improves climb after take-off, take-off run itself and should improve fuel consumption.

If it's speed and range you want in a four-place skipper of the skyways, the Bellanca warrants your consideration. At 2,450 rpm, Dick Hart buzzed all the way to Grand Rapids and back, indicating 160 and 162 mph at 4,000 feet of altitude. That's pushing the Franklin engine a little but sometimes speed is that important. Normally, the *Cruisair* hits it off at an indicated 142 mph at 3,000 feet of altitude with 2,400 rpm. If you've "good hands" and can get the ship on the step, it'll make from 147 to 150 mph from the same rpm. Technique will pay off.

Herb Venable has obtained 153 mph at 2,435 rpm at sea level cruise . . . literally, too; being 10 feet off the Delaware River surface.

Fuel capacity being what it is—20 gallons each tank, or 40 gallons total—the Bellanca has a time-above duration of 4 hours 30 minutes. This carries the Bellanca some 650 miles hence.

Fuel consumption varies with mixture leaning, possible above 5,000 feet, and rate of rpm demanded of the engine. A 2,300 rpm setting will eat up around 9 gph (gallons per hour), although Dick Hart reported he used 10 gph when he over-cruised steadily at 2,450 rpm.

As for what the writer does and doesn't like in the Bellanca *Cruisair Senior*, it doesn't seem necessary to stress the "don't likes" too much. Pilots are a finicky breed (ask the aircraft manufacturers and their salesmen). Some of us don't object to certain things, others of us do—and strenuously. I

could say I object to having to wind up the gear and then roll it down. It so happens I don't object to this—in my opinion it is one very good way for a pilot to remember whether his gear is up or down. But if some pilots do object to manually operated gear, it should be pointed out that Bellanca is experimenting with a hydraulic retraction system which they hope to have available soon.

I'm apt to be persnickety about the way the throttle creeps (the *Aeromatic* prop has a way of sucking it in). However, Bellanca has an improved design on the throttle stem to thwart the prop's effort to pull the throttle along with it. Being used to the radio call number of the ship on the panel of AAF types, I'd like this serial number on my personal plane's panel. For my part the position of the flap lever is too far forward and the ground visibility is below par. However, other pilots I know of don't object to this at all.

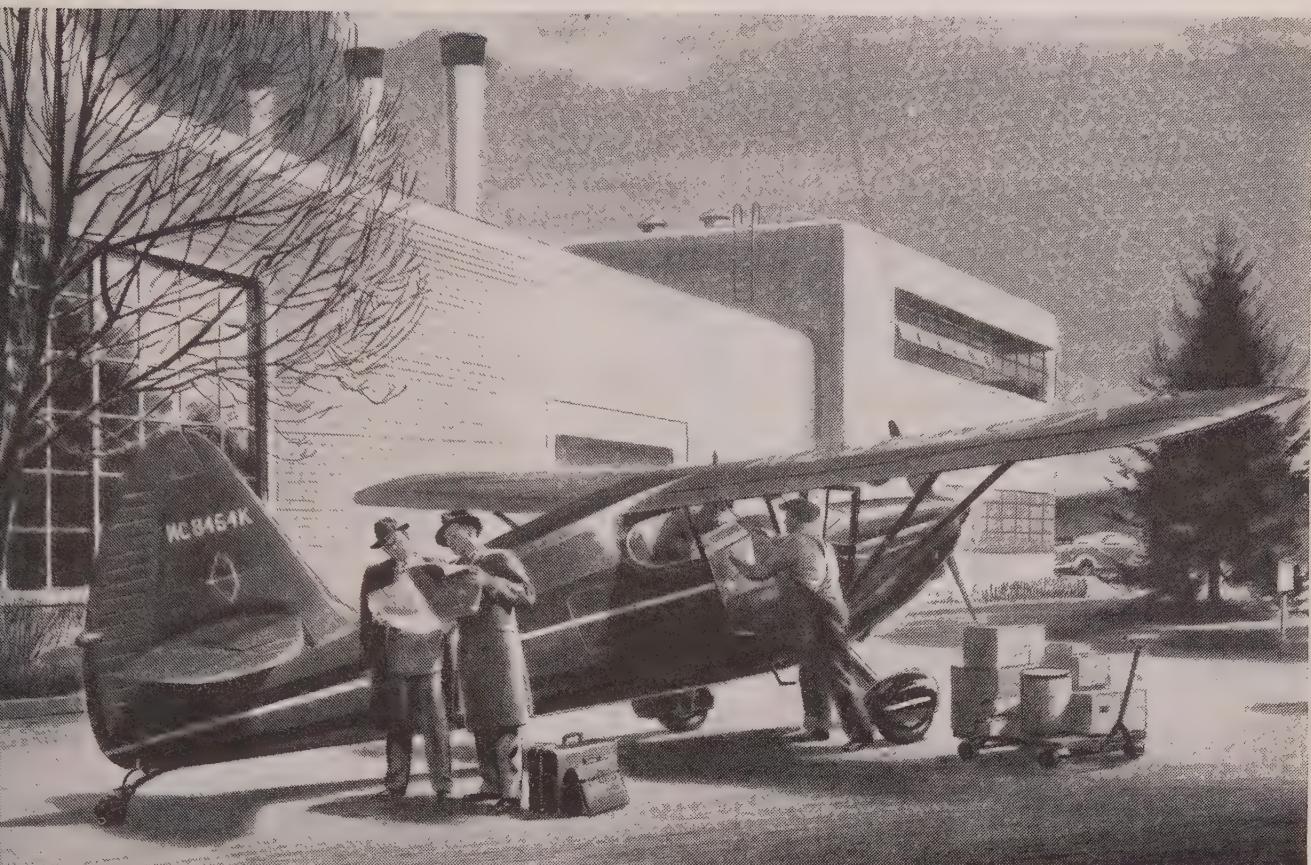
Of course, there are other features worth pointing up . . . printing on the panel gives the pilot good reference to fuel tank capacity (20 gallons left tank, 20 gallons right); so likewise a "2 gallons" sign for oil. The panel is shock-mounted which safeguards the life of today's personal plane's "too expensive" instrument equipment. Cruising speed is good. Flight visibility is good. Landings of around 45 to 50 mph (on NC 86721, the ship I borrowed from Air Facilities Corp. of Teterboro Airport, New Jersey and logged some 3 hours cross country time in) are at a low enough airspeed for some of us who aren't always in top-notch practice. The flaps are very effective, contributing to the fact that the *Cruisair* is a very maneuverable ship. Baggage capacity could be better for four people but with three it is entirely adequate . . . and in this respect it is no wise different from other ships in its price range.

This writer has his very own ideas (viz. not the Editors) about the pilots who will elect to own a Bellanca *Cruisair Senior*. It's just this. No one better than the flyer himself knows what he can handle in the way of a plane. If a plane seems too much for a pilot, he usually turns to another ship. The Bellanca will certainly fill the bill for any pilot with lots of hours. After that, the choice will be limited to pilots who happen to be at home in a plane regardless of the fact that their hours may be skimpy in total score. Therein lies the safety in the *Cruisair Senior*—in fact, in all ships on the market today. Pilots should buy and fly the ships that seem to be their meat—pride goeth before the fall. Perhaps, as a reporter on the *Cruisair Senior*, the writer has been a bit philosophical and a bit critical. Having spent one year reporting on about everything the aircraft market has put up for sale the past year, two things have become apparent. The manufacturer hasn't had ideal conditions under which to work and get out an inexpensive plane—and the pilot has in his "finicky" inimitable way elected the planes that should remain in a competitive market. Bellanca has been elected in this silent poll.

It's a good omen that companies, such as Koos Furniture Company, of Rahway, New Jersey, are finding today's personal plane an asset worth incorporating in their business travels. For there is manifold purchasing power and a solid foundation for plane ownership in business ownership of planes, such as the Bellanca *Cruisair Senior*.



Presenting America's first personal "cargo" plane



Flying businessman prepares to take off from company runway in his Stinson Flying Station Wagon to cover his 3-state sales territory.

...the new STINSON "Flying Station Wagon"!

Now, for '47, Stinson presents *another* outstanding 21st Anniversary plane in addition to the luxurious 4-place Voyager.

The second thrilling new plane is the usky Stinson Flying Station Wagon—America's first "workhorse" personal plane—a "fly-anywhere" plane with all the comfort features, dependability, and inherent stability of the famed Voyager.

Like the Voyager, this new Stinson

a proved personal plane—improved for '47!

If you're a flying businessman, you'll welcome this superb carry-all plane.

If you're a farmer or rancher, the Flying Station Wagon is just what you need for hurry-up trips to get equipment parts and other "needed-now" supplies. And on vacation, hunting, or fishing trips, there's room for all the duffle you'll

want to take along. Rear seats readily replaceable to make it a four-place plane.

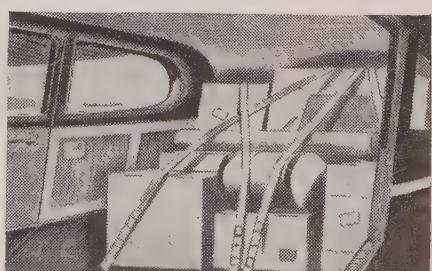
It carries a useful load of 1006 lbs. Cruises at 125 m. p. h. Maximum speed, 133 m. p. h. Take-off run, only 620 ft. Rate of climb, 650 f. p. m. Service ceiling, 13,000 ft. Stops in 290 ft. after landing.

Flaps for quick take-offs and slow, short landings. Built-in wing slots for safety. Inherently spin resistant. Two-way radio, with dome loud-speaker. Starter, hydraulic brakes, soundproofed cabin, and many other de luxe features.

See your Stinson dealer—today. Fly the new Flying Station Wagon—learn

how easily you can buy it—how economical it is to own.

Write for illustrated brochure to Stinson Division, Consolidated Vultee Aircraft Corporation, Wayne, Michigan.



The Stinson Flying Station Wagon is your own personal "cargo" plane! Reinforced cargo compartment (24 cu. ft.) in 2-tone plywood paneling, equipped with tie-down straps. Cargo capacity: pilot and 600 cargo pounds, or pilot, 1 passenger, and 500 cargo pounds. The two rear seats can be replaced in 5 minutes' time.

Stinson
FOR 21 YEARS—AMERICA'S
GREATEST NAME IN PERSONAL PLANES

Operation Rembrandt

(Continued from page 25)

your name, you can letter a plane. First of all remember that the alignment of the letters marks the professional.

Before you start lettering your aircraft look over magazines, newspaper headlines, and advertisements and see what sort of lettering you like. When you have selected the type of lettering you want, you're all set for the next step—getting it onto your ship.

First of all let's try it on some paper first. We'll lay it out full size of course, the same size in which you want it on your plane. It's a lot easier to correct a mistake on paper than on fabric. Measure the spot on your plane where you want your lettering to go and keep that in mind when laying it out.

First of all rule two horizontal lines as far apart as you wish the letters to be tall. If you are using both capital and small letters rule three lines—one for the tops of the capital letters and the tall small letters (t, l, k, h, f, etc.) one for the top of the short small letters (e, r, u, i, o, etc.) and one for the bottom of all letters.

Now, using charcoal (a charred stick will do) or a soft pencil, sketch in the letters. Look at the letters that you have selected as models and see how they are made. Note that all letters have a thick and thin side. Be sure to get your letters "thick" and "thin" in the right places. All horizontal strokes are thin and all down strokes are heavy while all up strokes are lighter. By "up" and "down" strokes I mean the strokes that one normally makes in lettering.

Remember that all capital letter "A's" should extend a bit above the top guide line or they will appear short because of all the white space on either side of the peak at the top. Some letterers also*make their "O's" run a bit higher and lower than other letters for the same reason. Suit yourself, bub. Check your spaces between letters so that they look even. I say *look* even for in some cases if the spaces *are* even it will not *look* even. For example, if you leave the same space on either side of the letter "I" that you do around other letters it will look very open. Chisel a bit on the space here and it will look better for the "I." Capitals "L" and "T"

should be moved closer too, when they are in this order, for otherwise the space in the angle of the "L" will look unusually big. Moving them closer together causes the top of the "T" to help fill in this area.

Check the placing of the letters, the spacing and the size before trying to duplicate on the aircraft. When you have it just the way you want it on paper, the problem is to get it in duplicate onto the fabric or metal of your ship. There are two methods of doing this.

The first is to do it all over again using the paper sketch as a model to copy from, carefully duplicating the style and placing of the letters. The second is to transfer the paper sketch to the plane itself. Either system will do the trick.

If you want to lay it out over again—rule your three lines directly on the fabric or metal. Use charcoal again for light fabric or metal, or chalk for dark fabric. A charred stick as I mentioned before will do for charcoal or buy some at an art store. Have your kid brother or young son bring home a piece of chalk from school for the dark fabric. Use these two mediums as they may be wiped off afterwards with a cloth or changed during the process without injuring the fabric or metal. Once the lines have been applied, go ahead and lay out your letters as you did on the paper, checking their placing and alignment as you go along.

Now if you prefer to transfer the paper sketch to the plane try this—rub the back of the sketch, covering every place where there is lettering on the front, with chalk or charcoal. Place the paper sketch against the fuselage and fasten with bits of scotch tape. Take a fairly hard pencil and go over the rough sketched letters pressing against the fabric or metal. (If against fabric don't lay on too hard with the pressure, or you may injure the aircraft.)

Before you remove the paper entirely, lift a few edges leaving the others stuck down just to be sure that you have been over every letter with the pencil before you take it off for good. I have found that using a colored pencil for the "go-over" assures that you hit every part of every part of every letter for you can see where you *have* been. Of course in transferring the paper sketch to the plane you must have sketched it on fairly *thin* paper. Otherwise the pressure

from the pencil will not go through. When you lift the paper off, if the chalk has been heavy enough, the pressure firm enough, and the lettering well laid out, you will have the "masterpiece" all set on for painting in.

If the lettering is faintly transferred, you may go over the lines making them heavier and straighter before you start to paint. Use the same chalk or charcoal again. Chalking the back of the sketch paper makes a sort of "carbon paper" out of it but be sure you get on plenty of chalk and that you cover every part of the paper with it that has lettering on the front.

Now you are ready for painting in the lettering with color. Use any good grade of oil paints. You can get them at any art store or paint store, or even at some stationery stores. Depending upon the color and size of the tube, they cost from 25 cents up. Get a brush at the same place, either pointed or square cut. They run about the same price, unless you lean to red sable or such stuff.

I like to use pure color right out of the tube (or can) for the simple reason that you don't have to worry about matching the color if you run short, although even a small tube will usually paint a good-sized name on both sides of the plane. If the paint is too thin in the can, either stir it up thoroughly, or pour the thin part off the top of the can and use the heavy part left in the bottom. There may be some thin oily paint in the top of the tube—keep squeezing slowly and you will find the thick paint right behind the "watery" part. *Don't* use thin paint for it runs like the devil on vertical surfaces and makes a messy job. Moreover, while it dries quicker than heavy thick paint, you may not fly with it for the slipstream will blow it back into the worst looking confusion you ever saw. On the other hand while heavy thick oil paint takes longer to dry, you may fly with it before it is set for it will not run.

Regular artists' oil paints take from a couple of hours to two or three days to dry thoroughly, while enamel or regular outside paint may dry in a couple of hours. If the paint in the tube is too thick for easy spreading thin with a little, (get that word *little*) linseed oil and add more as needed.

After the paint has dried thoroughly, wipe off the guide lines of chalk or charcoal with a cloth and there you are. If you have kept the letters clean, the sides straight, and the letters stopping at the three guide lines instead of extending above and below them, you will have a darn good lettering job—one you'll be proud to ride with.

Of course if you are the lazy type you can now purchase letters in the form of "decals" and slap them on like postage stamps. If you like the sound of that system be sure you still use the guide lines, unless you intentionally stagger the letters for effect. You're the boss. If a spray gun is handy at your field you might try cutting a stencil out of paper and spraying the lettering on. Be sure the stencil is tightly fastened with scotch tape and the rest of the area is covered with paper to protect it from flying paint. Leave the paper on until you are sure the sprayed letters are bone dry.

Don't hurry the job no matter how you do it, and don't try to do a professional job as quickly as they do it. If your hand is shaky when you get right down to getting the letters on straight and the edges clean and sharp, brace your hand against the fuse-

(Continued on page 76)



CESSNA SETS THE PACE AGAIN IN 1947 WITH More for your Money



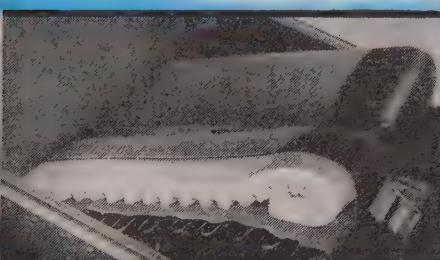
MORE Comfort, MORE Utility, MORE Safety, More for your Money



Durability Up, Maintenance Down! Cessna's all-metal structure is impervious to damp or dry climates, means maximum safety, minimum maintenance. A typical example of Cessna quality!

Airliner-Type Ventilation. Cessna's new noiseless, all-weather ventilating system provides precise, easily adjustable control of air flow into cabin. Rain-proof in flight or on ground.

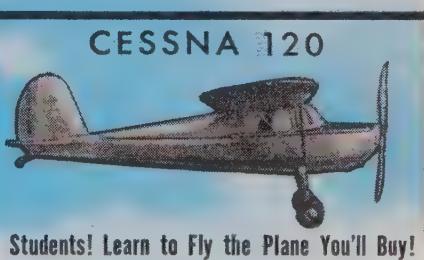
New Muffled Exhaust greatly reduces noise level both inside and outside the cabin, permits normal conversation in flight . . . another Cessna feature that adds to your flying pleasure.



New Interior Styling with top quality two-tone fabrics and genuine leather, plus new foam-rubber seat cushions mounted on no-sag springs, affords the utmost in beauty and flying comfort.



Redesigned Instrument Panel with new ultra-modern styling and rheostat light control, and shock-mounted for longer instrument life, greater accuracy. Also enhances interior beauty.



Students! Learn to Fly the Plane You'll Buy!

The Cessna 120 is the ideal trainer—the "station wagon" of the line. Same size as the 140—all-metal structure—top speed over 120 m. p. h.—a fine, general utility craft with real cross-country performance. See it at your dealer's!

Get off to a flying start on business or pleasure trips . . . in winter or summer . . . in a Cessna. It's a year-round, cross-country performer with a cruising speed over 100 m. p. h.—a range of more than 450 miles—a service ceiling of 15,500 feet and an 80-pound luggage capacity. Directional ventilation system makes possible heating the cabin for comfortable cross-country winter flying. What's more,

with the Cessna patented, safety landing gear, you can take off and land safely in winds that ground most light planes.

The Cessna 140 is a fast, clean, 2-place craft, that delivers for only \$3245 (f. o. b. Wichita). The 120 is basically identical—minus starter, generator, battery, flaps and with less luxurious interior trim—and delivers for \$2695 (f. o. b. Wichita).



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Cessna Aircraft Company, Dept. S—Wichita, Kansas
Please send free literature on Cessna 140 and 120.

Name.....

Street No.....

City.....State.....

Jets

(Continued from page 27)

of right now the British do have a clear-cut lead in the jet propulsion parade. This is admitted by many in American firms who are in the same racket, and is confirmed by engineers and other qualified observers who are familiar with American progress to date and who have been across and had a first hand look around at the British picture. We have talked with many such, and the only qualification to this general consensus (from one of our top men, and whose opinion is highly respected) is only that *in some ways* the British are ahead of the U.S., and that although at the moment they do have a larger number of actual gas turbine units—both turbojets and turboprops—in production and under flight test, in other ways American development is as far along as theirs.

Unquestionably, the aircraft gas turbine industry in the United States is developing at a rapid and accelerated pace. The big effort right now is concentrated on building prototype engines for endurance and acceptance testing. Along with this is the analysis of new and higher performance units, and review of the performance, maintenance and overhaul aspects of the turbojets and turboprops in actual operation.

Some of the reasons for the British lead are fairly obvious. First of all, it so happened that Frank Whittle was a Britisher, and there is no argument about the fact that he is the man of the hour in jet propulsion. As Ted Wright of CAA put it, "If it is true that genius is one per cent inspiration and 99 per cent perspiration, Frank Whittle wins on both counts, as he has contributed heavily of both." His unique contribution was coupling, in a flash of insight, the old principle of reaction power with the relatively new gas turbine device. Following this, after a dead period of five years (1930 to 1935), his persistence in the face of professional skepticism and of early governmental inertia and apathy, plus his tireless patience in actually working out an aircraft gas turbine which would run and then develop enough power to fly an airplane finally put the thing across.

Besides the British head start in time, a further reason for the present American lag is the terrific piston-engine program this country had to maintain throughout the war.

Leaving for the moment certain distinctive American developments (notably the Westinghouse and General Electric axial-flow projects), the relation between the British and American jet programs should be clearly understood. From August 1941 (three months after the first Whittle jet engine was test flown in the Gloster E 28/39) until the end of 1945 the British made all their knowledge of aircraft gas turbine developments available to the U.S. government. From October 1941 they actively assisted General Electric (as contractors for the AAF) to get into early production a jet unit of the Whittle type, using a centrifugal or radial compressor. Close collaboration continued as GE designed and developed first the I-16 and then the I-40 jet engine, and as Rolls-Royce (picking up the ball from Rover) went on to the *Welland*, *Derwent* and *Nene* turbojet engines (named for English rivers), and de Havilland developed the *Goblin* and *Ghost* (all were Whittle types). Information

flowed freely in both directions, and some of the GE details were adopted by the British.

Just as the British developed the *Spitfire* to meet their strategic need of a superior, fast climbing, heavily armed interceptor, so their development of the turbine/jet engine (turbojet) from the mid-thirties met the distinctive needs of defensive fighter aircraft—lightning speed, high altitude performance, with range secondary. Thus within a few months of the cessation of hostilities it was evident that the turbojet had become the kingpin of every important fighter service in the world, army or navy. Even the best piston-engine fighters were obsolete.

American strategy on the other hand, called chiefly for long range bombardment,

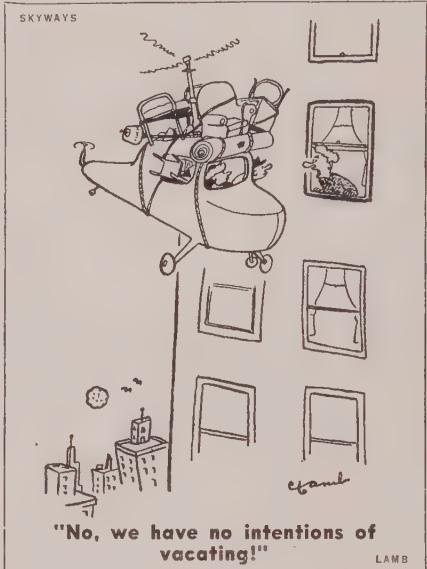
turboprop, of which several are now under development, ranging from 5,000 to 15,000 hp.

British claims to leadership in the jet field during the next few years will depend on whether the radial-flow *Derwent V*, *Nene*, *Goblin* and *Ghost* can keep ahead of the slowly advancing Allison J-33, and on whether new American axial-flow units excel the engines now being flight tested by Rolls-Royce, Armstrong-Siddeley and Bristol.

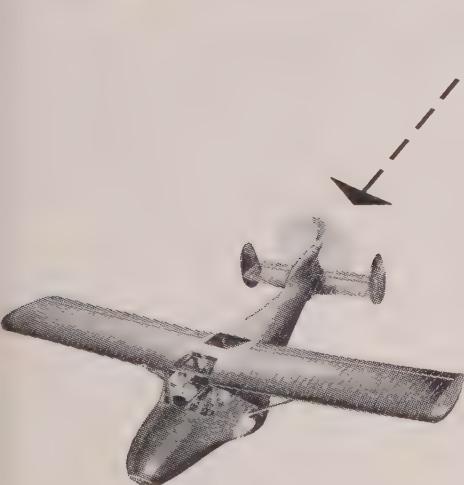
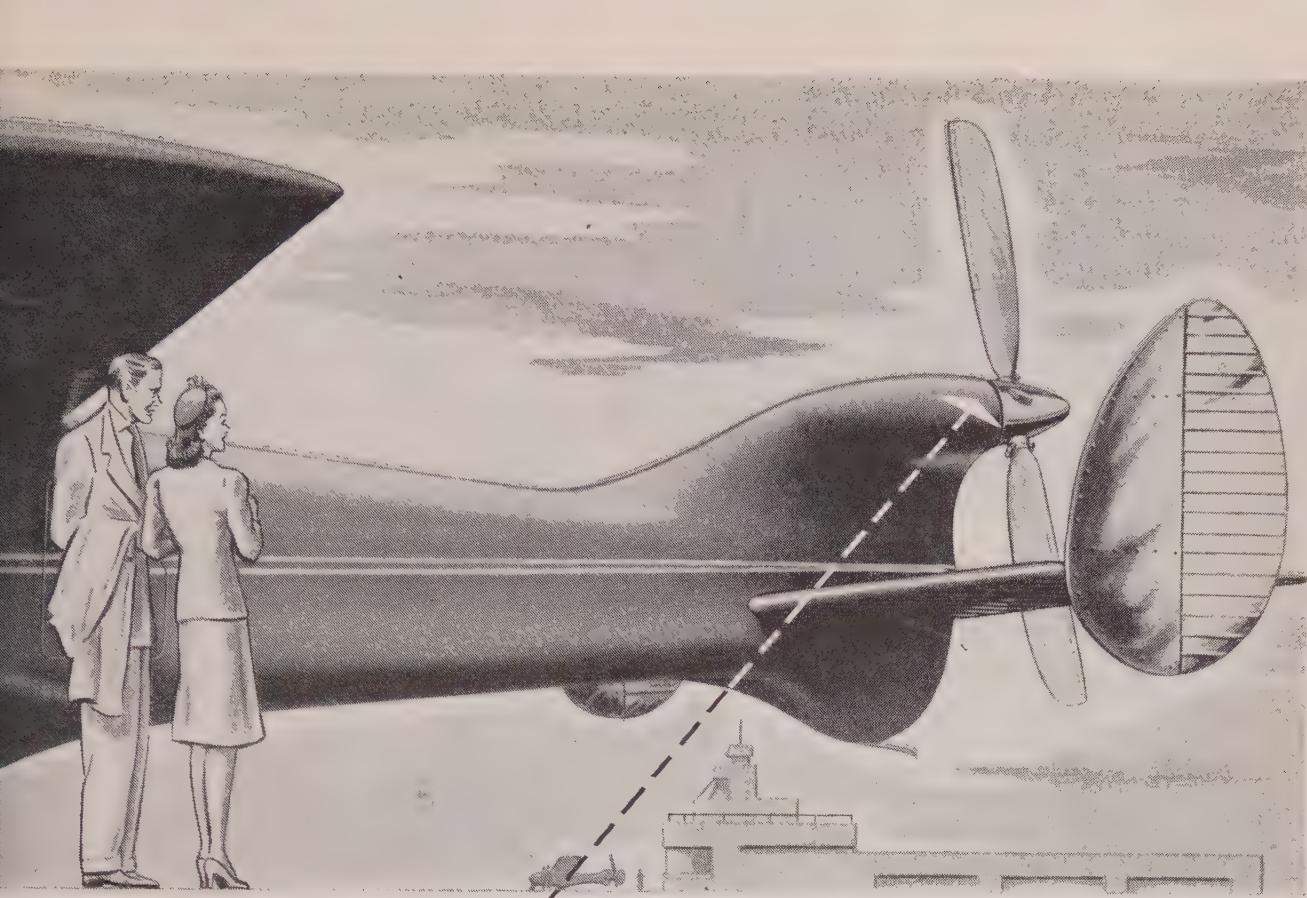
The performance to date hasn't been bad. The world's speed record of the Gloster EE 549 *Star Meteor*, almost equalled by the EE 550, both powered by *Derwent V*'s running at 15,200 rpm to produce 4,200 pounds of static thrust (normal 14,700 rpm, 3,500 pounds S.T.), is now five months old and substantial attempts have been made to better it, without success. The RAF reports that ground crews for the *Meteor* squadrons have been cut by 50 per cent on account of easy maintenance. Time between overhauls has jumped to 270 hours, with 360 hours due as soon as enough *Derwents* have completed the required service operation. In October a 28-month old *Derwent I* completed 1,005 hours of total running time on the test beds, 920 hours of it under rigorous type-test conditions. Only relatively minor replacements were found necessary. Rolls-Royce at that time had completed over 20,000 hours of jet engine test running. The de Havilland Company is also piling up an impressive total of such testing. This is fundamental in the British Air Ministry set-up, which pays for such test run time, thus providing a powerful incentive to the companies to produce stuff that will stand up under operational service conditions.

The Rolls-Royce *Nene* (of which the *Derwent V* was an 85 per cent scaled-down model, rushed through to provide a superior power plant for the Gloster *Meteor IV*) is the most powerful turbojet in the world, with a rated thrust of 5,125 pounds at 12,300 rpm, with a weight of 1,650 pounds, a better than 3:1 ratio. It was first test flown in a P-80A in England in July 1945, about 13 months later than its American opposite number, the General Electric I-40. Performance figures on this engine released a year ago gave 4,000 pounds static thrust at 11,500 rpm, with a weight of 1,820 pounds, a 2.2 to 1 ratio. A somewhat higher fuel consumption than the *Nene* is reported, and a much shorter time between overhauls than the *Derwent*. All I-40 production has been at Allison since mid-1945, and the Allison-built I-40-4 (AAF, J-33-GE-4) is rated at 3,850 pounds of thrust. All engineering and future development of the J-33 are now located at Allison, and a number of substantial improvements in both production and design have been made by Allison engineers. The J-33-17 model has passed the 100-hour type-test, and the improved -21 version is undergoing the A-N 150-hour test which has the same endurance standards required for reciprocating engines. A greatly improved turbojet, the J-33-AL-19 is lighter in weight and is expected to produce 4,500 pounds of thrust. This figure may be exceeded by later models, some of which will include a redesigned compressor permitting a larger air capacity, as in the *Nene*. The original I-40 was designed for 4,000 pounds of thrust, and started operations at 3,750 in 1944. The *Nene* was also designed for 4,000 pounds, has already

(Continued on page 62)



and was typified by the development (in the same mid-thirties) of the B-17 *Flying Fortress*, and later the B-29 *Superfortress*. The United States came into the jet propulsion picture in June 1940 with a special report to Navy on the gas turbine prepared by the National Academy of Science, which was preceded by some preliminary work at Wright Field. This was followed by the formation of NACA's Gas Turbine Committee in the early summer of 1941, with Dr. William C. Durand as chairman. Apart from the then secret Whittle-type project, (in the capable hands of GE's R. G. Standwick and D. F. ["Truly"] Warner), the tendency, following earlier NACA studies and experiments, was to favor the slim axial-flow type of gas turbine rather than the radial flow type with its greater frontal area. This was similar to the classic piston engine controversy, V-type liquid cooled vs. radial air cooled. (The axial-flow type is characterized by a straight flow of air through multiple compressor blades on a central axis (each set of blades called a "stage"), instead of a whirling of air in a large-diameter centrifugal impeller, à la Whittle.) It was thought that the multi-stage axial type (already familiar through many years of gas turbine development in non-aircraft applications) would be more efficient, provide greater pressure ratio, and thus permit greater range. It would also be especially suitable for the turbine/propeller combination, or turboprop, which features range rather than speed. This is the main reason for the American preoccupation with the



Why here?

Ever since the early days of aviation, the propeller on the nose of a tractor-type plane has subjected all surfaces behind it to the additional drag of the turbulent slipstream. Placing the propeller on the tail of the Waco *Aristo-craft* eliminates this drag.

Gone from the cabin are the customary propeller noises.

On the ground, elimination of "prop wash" allows plane doors to be opened easily . . . passengers may enter without walking into a "cyclone."

Last and far from least, the propeller is in the *safest* location on the airplane. Propeller accidents are virtually impossible with this arrangement.

That's why the Waco Aircraft Company has incorporated the "tail propeller" in its four-place *Aristo-craft* — the airplane with simplified uni-control.

Waco *Aristo-craft*



THE WACO AIRCRAFT COMPANY, 1703 PETERS AVE., TROY, OHIO, U. S. A.

Jets

(Continued from page 60)

passed 5,100, has turned up 5,400 on the test-stand, and an advanced model is estimated to reach 6,000 pounds for take-off.

It looks then as though the *Nene* will be one of the star performers of the next five-year period. It is the power plant of the *Nene-Vampire* (soon to go into service), the *Gloster Ace* (successor to the record-holding *Star Meteor*), a new Hawker design, the Vickers-Armstrong Supermarine E-10/44 high speed fighter, and the recently announced Armstrong Whitworth AW52 "arrow-head" flying wing twin-jet aircraft, most of which are likely to figure in the second round of world speed record attempts next summer.

In the export field, while a number of de Havilland *Goblin*-powered *Vampires* has been purchased by Sweden and Switzerland, it is the Rolls-Royce *Nene* jet engine which is holding the spotlight. Russia has already received 20 *Nenes*, Canada has gotten some for the RCAF, for their cold-weather testing in Winnipeg, and for jet aircraft being developed by A. V. Roe & Co. Canada, Ltd. Australia is also to build *Nenes* under license. Interest in South America has also been indicated.

In the United States, American Airlines' C. R. Smith is reported to have said that as soon as the *Nene* has been tested for a 500-hour span between overhauls (present airline practice on reciprocal engines is 600 to 750 hours), AA will be in the market for a high-speed jet transport. This was after he and Harold Harris, vice-president of American Overseas Airlines, had returned from European conferences with technical authorities on jet propulsion power. The U.S. Navy is also reported to be interested in the *Nene* for a new carrier-based fighter.

As evidence of the American interest in the *Nene* engine the activities of Taylor Turbine Corporation, New York, are noteworthy. Mr. Philip B. Taylor, Vice-President, Chief Engineer and later General Manager of Wright Aeronautical, is President, and Mr. S. T. Robinson ("Robby"), also formerly with Wright Aeronautical, serving as a lieutenant commander in the Navy as technical advisor for BuAer on gas turbine developments in England, is Vice-President. The company has negotiated a sales agreement under which a license may be acquired to erect, manufacture, test and maintain Rolls-Royce jet engines in America. For the present this means the *Nene*, and the Taylor staff is now preparing to redraw to conform to American practice the thousand or more important blueprints of the engine sent to the U.S. from England. (Packard went through this with the *Merlin*.) This indicates that not only importing of components, parts and assembly, but that eventually actual manufacturing will be done in this country, as an American version of the *Nene*. As a start two of the *Nene I* turbojets (and two *Derwent V's*) have been sent to the United States. One of the *Nenes* completed its 150-hour U.S. A-N type-test run in December at 4,500-pounds thrust. A second test at 5,000 pounds is now under way. Tests are being run at the Naval Air Material Center, Philadelphia. To provide the technical help required in these



American tests, Mr. J. P. Herriot, chief development engineer of Rolls-Royce, and who saw the *Derwent* and *Nene* through their 100-hour type-tests required in England, spent some weeks in this country, and Stanley Hooker, Rolls-Royce chief engineer, and other specialists from the company have paid short visits to assist in the early stages of transplanting the *Nene* on this side of the Atlantic.

Passing on to turbojets with axial compressors, the British have only one of this type which has been announced, against four of the radial type. Two of the Metropolitan Vickers F 2/2 turbojets were flight tested in a special *Meteor II* more than two years ago. The current version is the F 2/4 of 3,500 pounds static thrust, two of which are reported to be the power plants of the Saunders-Roe flying boat fighter. A much more powerful British axial-flow turbojet (not by Metrovick) may be announced shortly.

The United States has three turbojets with axial compressors, two in production and the third fully tested and expected to go into production during 1947 (Westinghouse 24C). The first is the General Electric TG-180 (AAF, J-35-GE), with 4,000 pounds of thrust, test flown in the Republic XP-84 *Thunderjet* in February 1946 and in the Douglas twin-jet bomber in June 1946. It is also the power plant of the North American XP-86 (counterpart of Navy's XFJ-1, but with sharply swept-back wings) the Curtiss XP-87 and advanced Northrop and Republic designs; also the XB-43, XB-46, XB-47 and XB-48 multi-jet bombers by North American, Convair, Boeing and Martin.

The other axial-flow unit now in production is the Westinghouse 19B *Yankee* (1,400 pounds of thrust), with the production model 19XB-2B at Pratt & Whitney for the McDonnell twin-jet FD-1 *Phantom*. The larger unit, 24C, is already turning up nearly twice as much thrust as the 19 (2,700 pounds), and when fully developed should be 3,000 pounds. It is a very nicely engineered job, and powers Navy's Chance Vought XF6U-1, Grumman XTB3F-1 torpedo bomber and other fighters and bombers. The AAF also has specified it for some of their new jet fighters such as the McDonnell XP-85 (originally to take the

(Continued on page 68)

Anglers' Holiday

(Continued from page 49)

We said so to Pedro. He lowered a small bucket overboard and hooked Virginia's line to it. Immediately the line began to tug and she looked at us starry-eyed. I need not tell you where we spent that evening when she discovered our "innocent" trick. It was a place familiar to most husbands—a small house with a gabled roof. As a rule you find a chain and a bone in the foreground.

The next day was another painful procession of lucky fishermen, and we weren't among them. Their tackle was no better than ours; their boats no faster, but while we returned with little fish, they weighed in marlin, dolphin and sailfish. Mr. and Mrs. McVey of Fort Lauderdale, Florida, brought in a beauty. We watched them haul in the wire leader, bring it closer, hand over hand, grasp the fish by the sword, and let Pedro club it. It was a little 110-pound number. As Betty saw the fish hit over the head, she screamed: "If this is big game fishing, give me little fish!" She need not have said it so loud; we all knew that was all she was going to get anyway. That was all any of us got. But we consoled ourselves with the fact that small fish were better than none at all.

We all tried to hide it from each other, but we were a disappointed bunch. However, once we were on land, our disappointment was soon allayed. A dirty little urchin, his brown skin showing through torn, baggy pants approached us. In broken English he made it plain that though cockfighting was illegal, "... for a small fee, Señor . . ."

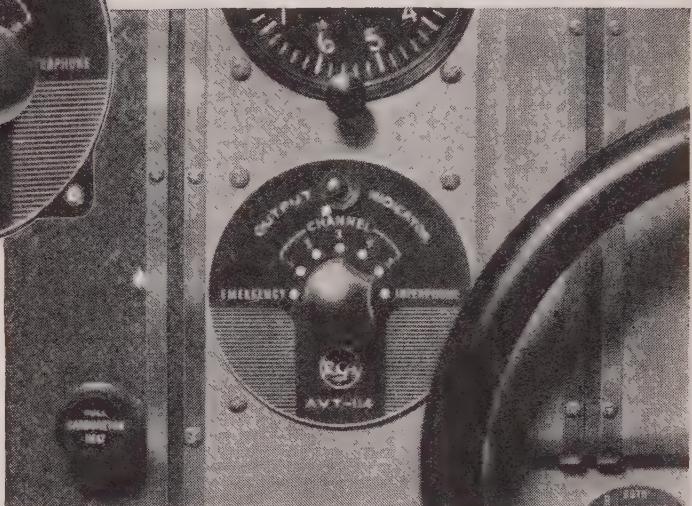
That evening, as the sun painted bold gold splotches on the bay, and gilded the town's ancient tile roofs, we followed a dusty narrow lane, flanked by 'dobe huts, to its odorous conclusion in a yard fenced in by prickly octilla branches. It formed a suitable frame for what might well have been a Covarrubias canvas: two dark squatting figures crouched in front of a chalk-painted circle. Under the elbow each held, close to his body, a game rooster. One was black, the other red, both with flaming red combs and fierce yellow eyes. The two little brown men sat very still. For a moment it seemed that nothing was going to happen. Then from nowhere Mexicans appeared, and one man who was obviously a bookie. The birds started getting nervous, raising their ruffs. We were not betting. We just stood by watching. It was one of the bloodiest fights I have ever witnessed outside the Louis-Galento fight. The red one attacked first. The black one feinted and circled like a wolf waiting to come in for the kill. But the feint missed. The red one landed on his back and the two tangled in a ball of bloody feathers and dust. Clawing, squawking they rolled, separated, came together again with the impact of steel spurs. For a moment it seemed like even Stephen, but the very next moment the doubt vanished as the black one trailed one wing, and looked dazedly out of one remaining eye. I led Betty away.

The following day more tourists caught marlin, mackerel, dolphin, grouper. We got nothing at all this day—not even little ones. Betty was in tears. Tears not being a planned part of a vacation, we all went window shopping in the narrow streets of

(Continued on page 75)



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SKYCRAFT—This picture of the new four-place *Skycraft* was made as it came in for a landing after its first flight. The test pilot's report was gratifying to the light-plane's builders. According to report, "ship showed no evidence of instability; low head temperatures indicated problem of cooling in pusher-type installation had been solved."

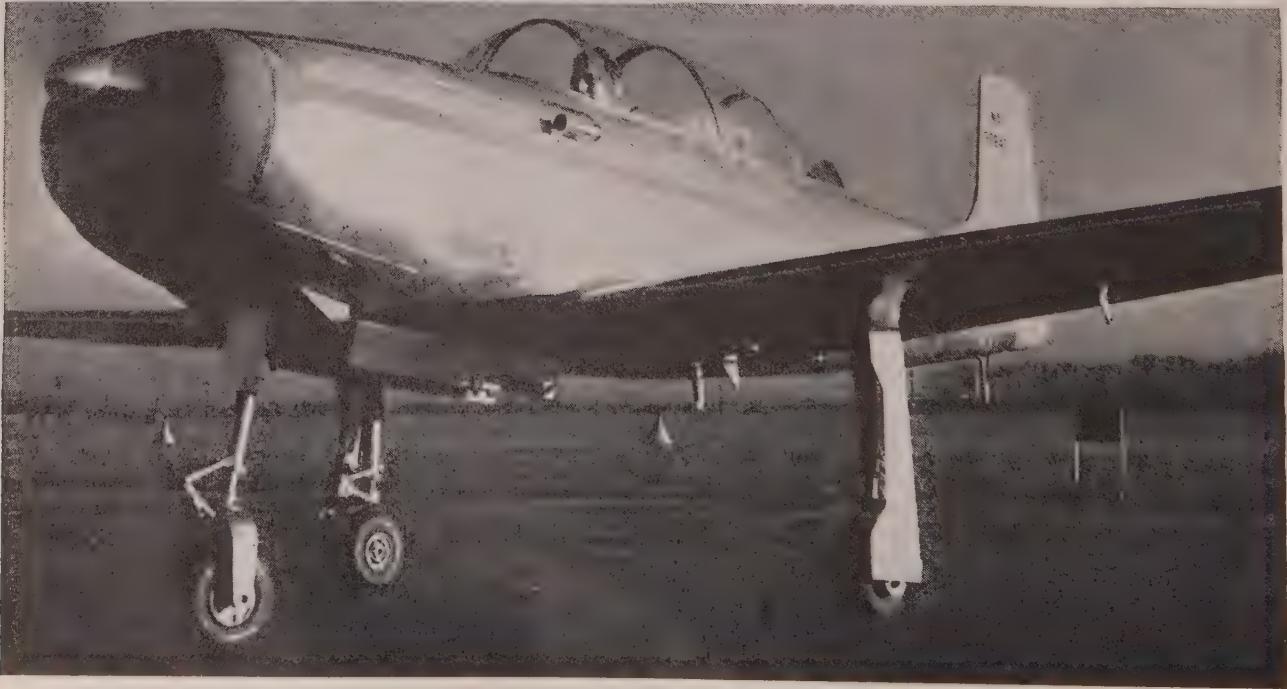
NEW...on the wing



MRAZ SOKOL—Czecho-Slovakia has come to the fore with new personal-plane design. Called *Sokol* (means Falcon), the plane features a retractable landing gear; is wood, fabric covered; reported to seat two. Powered by 105-hp Walter Minor 4-111 engine, the ship has a top speed of about 151 mph. It has fixed-pitch prop, wheel control.



FAIREY GYRODYNE—This helicopter, built by Fairey, is the first of a novel class of rotary wing aircraft known as a *Gyrodyne*. Unlike other 'copters, the FB-1 is propelled in forward flight by orthodox propeller. This is the Autogiro principle. It is reported that the craft's "safety in flight is assured by the low pitch of the rotor blade."



AFA STREAK—The Aero-Flight Aircraft Corporation up Buffalo way has come out with a "new" in personal plane design. Called the *Streak*, the ship is a two-place, low-wing, tandem, dual-control plane made entirely of metal. It is powered by 85-hp Continental, has estimated cruising speed of over 150 mph, and an estimated range of 700 miles.

...Your Engine

(Continued from page 32)

Fortunately, most operational engine troubles are cumulative in character, that is, they do not develop instantaneously but result from prolonged subpar operation. In practically all instances, subpar operation is noticeable if the pilot knows what to watch for. The ability to note these symptoms, and call them to the attention of a competent mechanic, is a large factor in minimizing preventable accidents. Thus the trouble may be traced to its source and corrections made before actual engine failure occurs.

As with ailments of the human body, many symptoms of subpar engine operation are misleading to the novice. Dirty, burned and pitted spark plugs are a good example in this conjunction. Spark plugs are more often unjustly damned than any other part of the power plant. After all, the spark plug is a very simple device, with no moving parts, and intended only to insulate a high tension current until it has a chance to jump the spark gap and ignite the fuel charge. Nine times out of 10, when a spark plug becomes defective in less time than its normal service life, the real trouble is elsewhere.

Fred Halloway, en route from Los Angeles to Denver, purchased three sets of plugs to acquire this knowledge. Fred noticed his engine was overheating before starting the trip, pulled the plugs, and discovered that the electrodes were badly burned. He installed a new set. The engine purred like a satisfied cat, and Fred congratulated himself on saving the cost of inspection by a

licensed mechanic. The engine continued to purr until a few miles out of Reno, when again it became sluggish and the head temperature gauge spiraled. Once again Fred pulled the plugs; once again they were dirty and burned. While installing the second set, the pilot amused himself by cussing spark plugs in general.

Again a smooth engine—until within 50 miles of the lofty Denver airport. Fred scraped in, and claims he did it by lifting upward on the wheel and holding the airplane in the air. At Denver, he had a licensed "mech" pull the plugs and, you guessed it, they were dirty and burned. But this mech knew his business—new plugs just don't burn unless there is a reason for it. He looked things over. One of the high tension cables had punctured insulation and was "leaking" badly, reducing the voltage pressure of the entire ignition system.

The low electrical resistance of new, clean plugs permitted enough spark to pass to ignite the charge. But the moment the plugs became slightly fouled by carbon, increasing their resistance, the spark became weaker, the engine ran hot and combustion was poor. Under these conditions, the plugs continued to gather dirt and the electrodes to burn away. A new wire and a third set of plugs solved the problem.

Why, no one knows, but next to a pretty girl, many pilots are fascinated most by magneto breaker points. They derive satanic pleasure from removing the cover, noting that the points are grayish-black in color, then polishing them bright with tools ranging from a strip of sand paper to a wood rasp. This practice rates a specific "don't." The

grayish-black color of the breaker points is entirely normal, and unless they are pitted and burned, no attention is necessary.

There are two more "don't's" that pertain to the ignition system. Don't under any circumstances disconnect the magneto ground wire when your poor judgment prompts you to tinker with the engine. You might just as well flip the switch to the ON position and leave it there. More than one pilot has parted company with both dignity and useful body members because he turned the engine through compression with the magneto ground wire disconnected.

And don't over-lubricate the magneto cam. Oil is a very good insulator, and after all the magneto is an electrical generating unit. Under-lubrication is far safer than over-lubrication, but the happy balance is to apply just enough light oil to dampen the oil wick.

One "do" pertaining to the magnetos is all-inclusive. "Do" leave the magnetos alone. They are relatively simple gadgets and seldom go wrong, but when they do, even a licensed mechanic hesitates to make adjustments without the facilities of a testing unit.

In tackling operational troubles originating in the fuel system, we encounter a class of trouble that causes more repair bills, more engine failures, more forced landings, and more injuries and fatalities than all other engine troubles combined. At the same time, fuel system troubles are more often due to "pilot" than any other type error.

One of the most dangerous of fuel-system troubles, because it happens so often immediately after take-off, is carburetor icing. It may occur at ambient temperatures of

(Continued on page 74)

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AAF Reserve Program

(Continued from page 52)

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 Topeka Army Air Base, Topeka, Kansas.
 Chanute Field, Rantoul, Illinois.
 Selfridge Field, Michigan.
 Wold-Chamberlain Airport, Minneapolis, Minn.
 Lowry Field, Denver, Colo.
 Scott Field, Belleville, Ill.
 Sioux City Army Air Base, Iowa.
 Orchard Place Airport, Chicago, Ill.
 Smoky Hill Army Air Field, Salina, Kansas.
 Fairfax Field, Kansas City, Kan.
 Offutt Field, Fort Crook, Nebraska.

FOURTH AIR FORCE

Major General Willis H. Hale, Hamilton Field, Calif.
 Hill Field, Ogden, Utah.
 Portland Army Air Base, Oregon.
 McChord Field, Tacoma, Wash.
 Spokane Army Air Base, Washington.
 Luke Field, Phoenix, Ariz.
 March Field, Calif.
 Hamilton Field, Calif.
 Long Beach Municipal Airport, Calif.
 Mather Field, Sacramento, Calif.
 Great Falls Army Air Field, Montana.
 Davis-Monthan Field, Tucson, Ariz.

TENTH AIR FORCE

Major General Howard M. Turner, Brooks Field, Texas.
 Barksdale Field, Shreveport, La.

Ellington Field, Houston, Tex.

Tinker Field, Oklahoma City, Okla.
 Brooks Field, San Antonio, Tex.
 Bergstrom Field, Austin, Tex.
 Biggs Field, El Paso, Tex.
 Fort Worth Army Air Field, Texas.
 Goodfellow Field, San Angelo, Tex.
 Hensley Field, Dallas, Texas.
 New Orleans Municipal Airport, La.

ELEVENTH AIR FORCE

Major General Thomas J. Hanley, Jr., Olmsted Field, Penna.
 Richmond Army Air Base, Virginia.
 Godman Field, Fort Knox, Ky.
 Stout Field, Indianapolis, Ind.
 Phillips Field, Aberdeen, Md.
 Langley Field, Virginia.
 Olmsted Field, Middletown, Penn.
 Andrews Field, Camp Springs, Md.
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 Lunken Airport, Cincinnati, Ohio.
 Cleveland Municipal Airport, Ohio.

FOURTEENTH AIR FORCE

Brig. General Leo A. Walton, Orlando, Florida.
 Columbia Army Air Base, S. C.
 Keesler Field, Biloxi, Miss.
 Morrison Field, West Palm Beach, Fla.
 MacDill Field, Tampa, Fla.
 Morris Field, Charlotte, N. C.
 Miami Air Depot, Florida.
 Warner-Robins Field, Macon, Ga.
 Gunter Field, Montgomery, Ala.
 Jackson Army Air Base, Miss.
 Marietta Army Air Base, Ga.

Colonel Monro McCloskey, Chief of the Air Reserve and Air National Guard Division, summed up the importance and opportunities of the Reserve for us. "My own experience in the National Guard over many years before the war makes me believe that this program is not only valuable to the country but it will help the boys to get jobs in civilian life. The Army Air Force will give the training—everything from maintenance on up. A whole, rounded pattern of training is now getting under way.

"The country as a whole appreciates the necessity of preparedness. Since we can't support a large regular army, we must have a reserve based on trained civilians. Our position of world leadership requires it, and our defense is in the civilian.

"Under the present plan, any enlisted man who is good enough can work up to an appointment to Officers Candidate School and a commission. The emphasis so far has been on flight and technical training but only because those skills deteriorate so rapidly.

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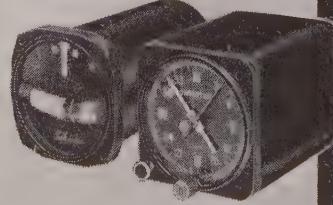
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AERO-FLIGHT AIRCRAFT CORPORATION

Jets

(Continued from page 62)

19B) the XP-88 and the BP 90, some of these combined with rocket units; also some of the new high speed medium bombers. The thing to watch for in 1947 is whether the British succeed in getting an axial-flow turbojet in the 6,000 pounds of thrust class into production and service with a greater operating life than the TG-180 and the 24-C, both of which produce far less thrust than that figure. At the present time the 180 has a rather short endurance between overhauls. U.S. turbojets in the 6,000 to 8,000 pounds thrust class are under development.

A final word on the turboprop developments. In England two Armstrong-Siddeley *Pythons* (3,670 hp, 1,150 pounds of jet exhaust thrust) have completed a 25-hour type-test run and are being flight tested as the outboard power plants of the big *Lincoln* heavy bomber. Two of the Bristol *Theseus* turboprops (1,010 hp, 320 pounds of jet thrust) are being flight tested in another *Lincoln*. The Rolls-Royce *Clyde* (3,000 hp, 600 pounds of thrust) has been running on the bench for about two years. The Rolls-Royce *Dart* (1,000 hp, 350 pounds of jet thrust) has been undergoing bench tests since August, 1946. Armstrong-Siddeley's lightweight *Mamba* turned up its full designed shaft horsepower and thrust (1,120 and 320) within six months of its first test run; weight is 750 pounds, diameter 27 inches.

At present the United States is in the lead on turboprops to the extent that the General Electric TG-100 was flight tested as the primary power plant of the Consolidated Vultee XP-81 (December 1945) and more recently of the Ryan XF2R-1. This unit is rated at 2,200 hp with 600 pounds of jet thrust. Improved versions of it are under development by GE. One version of the TG-100 is scheduled for United Air Lines' Martin 304, and Convair is greatly interested in a more powerful turboprop for their model 240. As previously noted, many such are under development in this country, and probably some lightweight ones also.

An example of a 30-passenger British jet airliner is Vickers-Armstrong's V.C. 1 *Viking*, to be powered by two *Nenes*, with estimated top speed of 450 mph. Another version of the *Viking*, the V.C. 2, will have four Rolls-Royce *Dart* turboprops of 1,000 hp, estimated speed 350 mph. A fleet of 25 Miles *Marathon* Mk V's to be powered by four *Mamba* turboprops has been ordered, and an advanced model of the *Hermes* will employ the *Theseus* long-range turboprops. Bristol's more powerful *Proteus* will be used on the Bristol 167 transatlantic airliner. These models are on the revised list of Brabazon types. This is an approved list of seven commercial types prepared by the Brabazon Committee, of which Lord Brabazon, Minister of Civil Aviation, was chairman. Most of these will eventually take turboprops or turbojets. Certain of the types are planned to be ready for the 1950-53 first stage of the gas turbine era (mostly turboprops), and plans are now in the mill to lay the foundations in 1947-50 for the types required in the 1953-56 second stage (mostly pure jets). It is this kind of detailed planning that makes one realize the British really do mean business in this matter of air leadership.



PROP WASH

Aero Oddities

Time Out. Lightplane pilot Virgil B. Day Jr. made a forced landing on a football field, interrupted the game, in Kearny, N. J. A tackle located the trouble (a plugged gas line), fixed it, helped Day take off again, then the teams resumed their game.

Bagged. Airport operator T. B. Stable ran afoul of the law. Was arrested on charges of hunting ducks by plane over a game preserve. Info filed with U. S. District Court stated Stable "did unlawfully hunt, pursue various migratory game birds in that he operated aircraft and by means thereof did concentrate, drive, rally and stir up various migratory water fowl."

Sky Hunting. Mr. and Mrs. Al Bahrt, Milwaukee, could find no place to live, so hubby took off in personal plane, scattered 1,300 leaflets explaining his plight. Got an answer.

Range Riding. It used to take operators of the Lott ranch, near Twin Bridges, Montana, four days to inspect the range. Short for time, J. Mortimer Lott, Jr., hired a plane, did the job in less than an hour, liked it so well plans to continue using a plane to hunt stray cows, inspect property.

Aerial Commuter. Harvard student Nathan H. Fish lives in Bangor, Maine, goes to school in Cambridge, Mass., gets there daily via personal plane.

Fair Exchange. Cabbie Earl Plessman drove Tom Sims, cargo-plane pilot, from San Francisco to Oakland airport, where Sims' plane was hangared. In return, Sims loaded Plessman, complete with cab, into his ship, flew him back to Mills airport in San Francisco.

Quick Move. Pilot F. O. Berry had to move his family from Portland, Maine, to California. He borrowed twin-

engine cargo plane, loaded family and furniture aboard, was installed in new home 16 hours later.

Ferry Marry. Pilots Dorris Day and John Renna met on plane-ferrying trip, landed at Orange, S. C., were married, continued flight to Miami in single plane.

Presidential Poke. Wife of President of United States was asked to christen airplane; she did; dented plane's nose with champagne bottle.

Only Airminded. Marine Corps ace, Lt. Col. Gregory Boyington, took examination in California for his auto-driving license, failed.

Heaven Sent. Detroit bride and groom, carrying out "marriages are made in heaven," chartered plane for wedding ceremony high over the auto city.

I-2-3 John "Sparky" Jarosik came home from the wars, carried out promise he had made before going overseas—parachuted down into the hometown, Meadowland, Pennsylvania.

Data. According to study made by airline medic department, only three of each 1,000 passengers become air sick.

New Engine. Work is being completed on new lightweight Diesel engine that will fly 130 miles at a phenomenally low fuel cost of only 27 cents.

Att'n Readers:

PROP WASH is your column. If you have any news-note oddities pertaining to aviation, send them to SKYWAYS, Prop Wash Editor, 444 Madison Avenue, New York 22, N. Y. Five dollars will be paid the sender of each "oddity" printed on Prop Wash page. In cases of duplication, the Prop Wash contribution first received at the office of the editor will be honored. Contributions cannot be returned unless they are accompanied by stamped addressed envelope. Decision of the editors is final.

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C125. This 125 h.p. postwar Continental engine is part of the broad Continental line of eight models, ranging from 65 to 185 horsepower. The C125 is exceptionally light, and develops its rated power at low rpm. Continental also produces radial engines of 220 and 525 horsepower for executive and feeder line planes.

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Dilbert

(Continued from page 45)

least be sure to keep plenty of excess speed.

GRAVEYARD SPIRAL—A twin-engine transport took off shortly before daylight. Take-off was normal, but at 400 feet the plane went into a gliding spiral and crashed. The pilot later stated that he thought he had enough visibility to fly contact, so he hadn't bothered with his instruments. By the time he realized he couldn't see, it was too late. He was trying to shift to instruments when he hit.

Here is more proof, if you need it, that you can't fly by the seat of your pants in instrument weather. Your senses will play you false unless you have a visible reference. This Dilbert had over 3,000 hours experience.

This accident sounds like a "graveyard spiral," which is one of the greatest dangers when you can't see. It starts with your airplane entering a shallow turn so gradually you don't "feel" it at all. Then the angle of bank and rate-of-turn both increase so slowly



"Reversal of perception"

that you get no sensation to tell you the attitude of your plane has changed. You definitely retain the positive impression of flying straight with wings level.

Your first indication that anything is wrong is a change of noise, an increase in airspeed, or a loss of altitude. In good visibility you, of course, immediately recognize your position. Or if you look at and believe your instruments, they will show that the airplane is banked and turning. The danger lies in not

doing this, however. Since you believe you are merely in a glide, your normal reaction is to pull back on the stick.

Once you do that, the turn gets tighter, the nose drops lower and there is a rapid increase in airspeed and rate of descent. In a few seconds your speed may double and your rate of descent increase to several thousand feet per minute. If you are an inexperi-



"A pilot needs good horse sense"

enced pilot, fright and confusion usually accompany this unexpected reaction. This prevents you from thinking clearly or from overcoming the fixed idea that you are in a straight dive. It is only natural to pull back harder and harder on the stick, in the blind hope that the plane will recover.

Of course, it is easy to get out of a graveyard spiral. Fight your desire to act according to your sensations. Make yourself stop the turn by leveling the wings. Then, and not before, use the stick to pull out.

There is only one way to keep out of this predicament. Don't try to fly contact during instrument weather in the first place.

BOW-LEGGED STUDENTS PREFERRED—The instructor took over for take-off after a student made a cross-wind landing in a small field. The student relaxed in the rear seat with his feet flat on the floor and his knees bent inward. When the instructor pulled back on the stick to clear obstructions at the end of the field, the student's left knee became jammed between the stick and the (Continued on page 71)



"Good reason why bow-legged students are preferred"

Dilbert

(Continued from page 70)

seat. The harder the instructor pulled the stick, the more impossible it was for the student, yes it was Dilbert, to get his knee clear.

The airplane wrapped itself around a tree after crashing through the boundary fence.

Students learned many years ago that jamming the flight controls was one of the easiest ways to drive instructors frantic. And they have been doing it ever since. Those with big feet jam the rudder bar and those with knock-knees jam the elevator controls, like Dilbert did in this case.

The only way to cure the rudder jamming artists is to catch them when they are young and bind their feet, as they used to do with Chinese women.

Keeping the knock-kneed ones on horseback whenever they aren't flying makes it harder for them to jam the stick. There must be some easier way than this! Any day now I expect to hear that some wild-eyed instructor has invented an automatic knee-spreader bar.

REVERSAL OF PERCEPTION—
If you have ever used a gyro horizon, you know that the horizon indicator remains in a fixed position with respect to the actual horizon. It is the little airplane on the instrument, representing your plane, which revolves around it, as shown in fig. 1.

Occasionally a pilot, who has stared intently at the instrument panel for a long period during an instrument flight, becomes the victim of a reversal of perception. He perceives the horizon bar tilting rather than his plane tilting with respect to the horizon. For instance, when he makes a left turn, he sees the horizon bar tipped to the right, as shown in fig. 2, and he endeavors to level it by lowering his left wing. This increases his angle of bank to the left and, as his nose drops, a "graveyard spiral" may result.

The chances of this mistaken conception occurring are increased if you have been under strain for a long time and are fatigued. Preventive action lies in being aware of this danger and in continually reminding yourself that you can always bring the wing up to the horizon but can never bring the horizon down to the wing.

AN AVIATOR'S GREATEST NEED
—There is no substitute (not even "aerodynamically") for that good old-fashioned horse sense.

DILBERT'S DILEMMA

When I left home my Mother warned,
"Now Dilbert, don't be breezy!
Don't fly too high and not too fast,
And do land slow and easy."

At flying school a chap next warned,
"Now Dilbert, this please heed!
Don't fly too low, nor yet too slow,
And land with plenty of speed."

What should I do and whom believe;
How high to go and at what speed?
I know my Maw wouldn't tell me wrong,
But this guy's my instructor!

Uncle Seth



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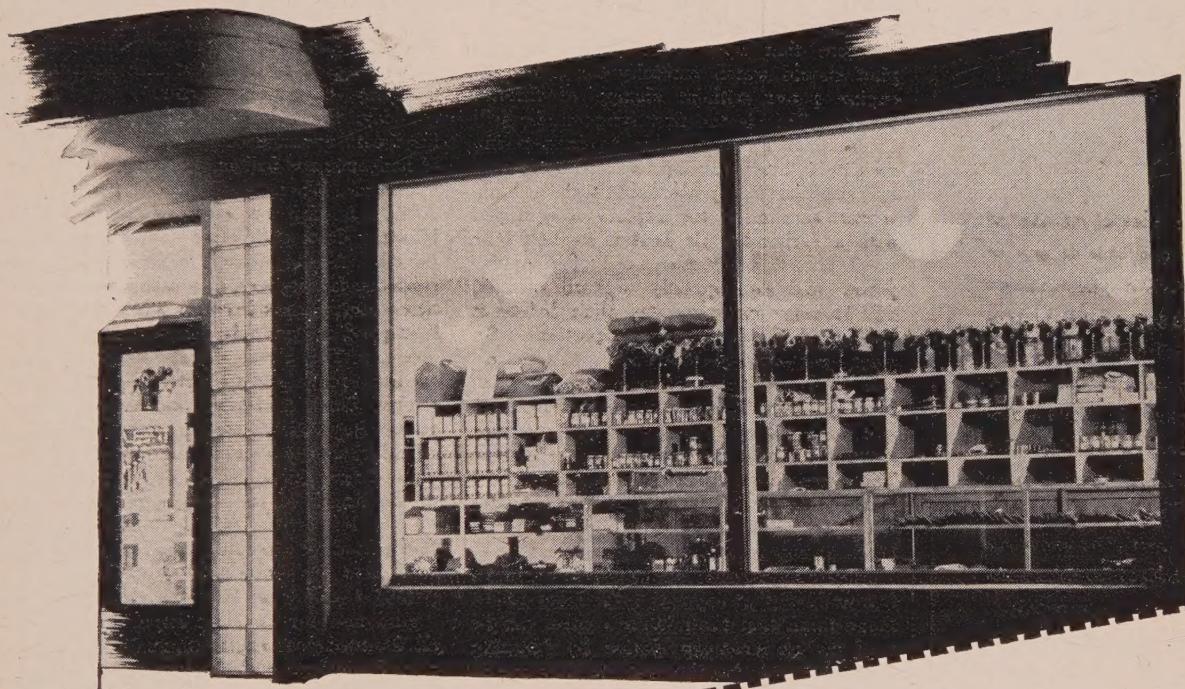


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...Your Engine

(Continued from page 65)

85° F., yet never occurs at 20° F. This is because air at lower than freezing temperature does not contain sufficient moisture to cause ice formations. It is a well-known scientific fact that when a liquid is vaporized, a considerable drop in temperature occurs. In the case of gasoline drawn through carburetor jets by the vacuum in the venturi, this temperature drop may be as much as 60° F. This low-temperature vapor extracts heat from the surrounding air. When this heat extraction is sufficient to lower the air temperature below freezing, moisture in the air will turn to ice. The ice gathers on adjacent metal structures in the venturi, and when allowed to gather in sufficient volume, will effectively choke the fuel and air passages, and may even interfere with operation of the throttle valve.

A preflight check of weather conditions, with special attention paid to humidity and temperature, is the best guarantee against icing conditions. Temperatures between 40° and 75° F., in conjunction with high humidity, are conducive to ice formation.

Aware that icing conditions exist, the pilot should watch carefully for a loss of engine power without change of throttle position. This is the first symptom he will notice, and is most liable to happen immediately after take-off, with the engine operating at full power and with a high-venturi vacuum. If the airplane is equipped with a carburetor air heater, it should be used immediately. Also, reducing engine power and consequently venturi vacuum, will in some instances stop icing before it has reached dangerous proportions. An emergency measure sometimes used with success is to set the mixture control at "full lean" position. This will cause the engine to spit back through the air scoop, and may actually blast the ice from the intake system. This emergency measure is recommended for lightplane engine only, and not engines equipped with heavy propeller, propeller gears or supercharging equipment.

Proper adjustment of the mixture control is a problem that seems to baffle many pilots. Some think that the mixture control can be used as an economy device by "leaning down" the mixture the moment they are in the air and throttled down to cruising speed. This is wrong thinking, and when continually practiced, may cause engine damage far in excess of the value of any fuel saved. Excessively lean mixtures cause detonation and overheating, leading eventually to preignition, severe overheating, high oil temperatures and poor lubrication. A gallon of fuel saved by too lean mixtures may cost a set of scored pistons and rings.

During take-off, or at any time while the engine is delivering full power, the mixture control should be set at full-rich position. This adjustment will seldom require change on lightplanes engaged in "airport flying." In cross-country flying, or when the engine will be operated for extended periods at not more than 80 per cent of rated power, the mixture should be leaned just sufficiently to obtain smooth operation.

An incorrect mixture ratio produces symptoms that are easily recognizable. Mixtures that are too rich will produce black smoke and a dark red exhaust flame. There will be

a tendency for the engine to run cold, as noted by a drop in head and oil temperatures. The power impulses will be uneven, or "gallop," and there will be a power loss without change of throttle position.

When the mixture is too lean, the exhaust flame will be short and dark blue in color. The engine will overheat quickly, and lose power. In many cases, a too-lean mixture will result in spitting and popping through the air scoop. When any of the above symptoms occur, and adjustment of the mixture control fails to correct them, a mechanic should be consulted immediately. Wrong mixture ratios may be produced by other fuel system defects including induction system leaks, loose carburetor jets, leaking primer valves, or improper carburetor float level. Correction of such defects should not be attempted by an unlicensed person.

As with magnetos, "do" leave the carburetor alone. An experienced mechanic hesitates to make comprehensive carburetor adjustments without the testing facilities of a flow bench. The one exception is the idle adjustments which an experienced mechanic can make by following the detailed instructions in General Engine Bulletin No. 2. The pilot himself should never attempt this adjustment. More engine cut-outs during take-off are caused by incorrect idle adjustment than any other single factor.

Today, the airports of this country are lined with unhangared planes. This shortage of hangar space will undoubtedly persist for some time. When an airplane is parked outdoors, it is subject to every weather whim, to blowing dust and other atmospheric impurities. A good cover, especially for uncowed radial engines, may save its cost many times over. Remember that when an engine is stopped, certain valves in certain cylinders are open. This allows direct contact between the atmosphere and the internal parts of the engine. Dust, moisture, and other atmospheric impurities, entering the combustion chamber, act to corrode the cylinder walls. This danger increases in direct proportion to the length of the storage period, as the oil film left on the cylinder walls from the last period of operation gradually oxidizes and loses its protective properties. "Do" protect your engine from the elements.

And now for the most important "do" of all. Do read your engine manual! If you buy a used airplane and the manual is missing, order another from the engine manufacturer. Remember this—that manual was written by the experts who built your engine. The operational limitations such as maximum crankshaft speed, maximum and minimum oil temperatures and pressures, manifold pressures, head temperatures, etc., were determined by exacting laboratory experiments and flight tests. When your instruments tell you that any one of these limitations is being exceeded, a supervised check-up is in order. Some of the instructions may sound pre-emptive, even foolish in the light of your own knowledge. They're not. Engineers don't toy with facts.

As one pilot put it while making out an accident report and filing an insurance claim, "That was a good engine in my crate. It ran a lot cooler than the instruction book said it should. Damned if I can see why it stopped!" Then, as the story goes, he glanced up in surprise when the CAA inspector keeled over in a dead faint.

Angler's Holiday

(Continued from page 62)

Guaymas. The first 10 minutes made Betty forget her troubles—she bought a cockeyed mirror in a hand-hammered tin frame, and candlesticks in the shape of flowers and fish. She tempted me to buy a purse, billfold, and belt of beautifully tooled Mexican leather, nice to touch and ripe to smell. It was made by painstaking craftsmen to whom time existed only in terms of *mañana*—tomorrow—which somehow never came.

Out on the street we were stopped by itinerant musicians who, for a quarter, serenaded us until we cried Uncle. On the waterfront we were again approached by urchins who wanted to sell us fishing poles of rather obscure origin and large dead fish which, they intimated, were still good for pictures. And out of every corner crawled old beshawled Mexican ladies, some afoot, some behind basket-laden donkeys, ogling at us from dark inscrutable eyes as if we were something from a monkey's family album. We met Yaqui Indian boys—lithesome and muscular, with their unkempt hair straggling all over their head. They moved with a catlike gait. We were told they made their living by dancing at religious festivals and the art was passed on from father to son. Many of them were taught dancing as part of their parents' religious promise. Some participated in the annual fiesta in Arizona.

The following morning the girls declared that we were jinxing them and that they were going out fishing by themselves. They meant what they said. They did not go out in a cruiser, however, but in a small skiff with a skittish outboard motor. The water was choppy and I was worried. Grabbing another skiff I followed them. By the time I found them, off Cabo Haro, they had boated a mackerel, a grouper, and a rooster fish. It took them the whole of next day to get over the excitement of it all.

But between me and the next guy, I might add that to an amateur fisherman going to Guaymas for a vacation, fish is the least important part. If it were not for the nosy relatives who demand to see pictures, we all would have had a better time fighting with our tangled lines while we inhaled that good sea air and watched others land whoppers with their more inferior equipment. But we managed to have a good time anyway.

We liked the languid tempo of the place where everything is *mañana*—maybe. And if it were not for big fish we did NOT catch, we never would have visited a Mexican wedding and learned to dance a *paso doble* to the confused strains of two itinerant bands. We never would have learned that the lighthouse atop the Cabo Haro was once a hangout of pirates; or that the giant bass are extinct because unsporting fishermen dynamited them. From Pedro I learned that the best way to land big game fish is to sit quietly in a skiff and splash water with your hand, making, like a gull catching a fish. The sound makes big fish come to the surface to share the gull's meal. The one thing I regret about this vacation is that I did not listen to Pedro sooner. I wish I had splashed like a fool. Then maybe it would have been Howard Ferris taking a picture of me with a 293-pound tuna.

Winged Warden

(Continued from page 37)

fishing law violators and so far he has operated ably in his slow-speed seaplane.

Tanner's assignment is to patrol almost half of the third largest coastline in the United States. The stretch from Port O'Connor to the Rio Grande is long. Inland waters are largely separated from the Gulf of Mexico by three strips of islands, the longest of which is Padre Island.

Laguna Madre is a strip of water extending the full length of this island. There is a great abundance of fish in the lagoon, Padre

Island presents a menace, however, due to the encroachment of low sand foreland which sands up large parts of the lagoon. Floods and hurricanes have destroyed the woody vegetation.

The lagoon water, occasionally, is three times as salty as ordinary sea water, thus killing the fish. Detecting salt water on Padre Island is the game warden's duty.

Fitted with pontoons, Tanner's plane can land on water not more than a few inches deep, enabling the game warden to personally investigate suspicious fishermen so swiftly that, should they be violating the law, there is no chance for them to hide illegal equipment or destroy contraband fish.

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Sports News

(Continued from page 43)

limits will not spoil the hunters' enjoyment, and at the same time will increase the supply of game.

A word of caution

Last month we showed a picture of two hunters bringing deer home on the floats of their Aeronca. This, as everyone knows, is not recommended procedure, and a word or two of caution is in order. The first caution, of course, is: DON'T DO IT unless you know how. If you happen to be the type who turns a deaf ear to "Don't's" then, we beg of you, at least take the plane's load capacity into consideration, be sure that your game is strapped on SECURELY, and see that the weight is distributed EVENLY.

Trout seasons open soon

Forward-looking trout fishermen are already planning their spring sessions with rod and reel, studying their air maps to see where they can go on a two-day week-end. The following is a list of trout seasons, according to State and month.

March

Tennessee..... March 1 to October 1

April

Colorado.....	April 10 to October 31
Connecticut.....	April 20 to July 15
Delaware.....	April 16 to August 15
Georgia.....	April 1 to November 15
Illinois.....	April 1 to September 30
Maryland.....	April 15 to July 15
Massachusetts.....	April 15 to July 31
Michigan.....	April 27 to September 2
Minnesota.....	April 1 to September 15
Nevada.....	April 15 to October 1
New Hampshire.....	April 15 to October 1
New Jersey.....	April 15 to July 15
New York.....	April 16 to September 8
North Carolina.....	April 14 to September 1
Ohio.....	April 15 to September 15
Oregon.....	April 20 to October 31
Pennsylvania.....	April 15 to July 15
Rhode Island.....	April 15 to July 15
Virginia.....	April 20 to July 31
West Virginia.....	April 28 to July 15
Wyoming.....	April 1 to October 31

May

Arizona.....	May 30 to October 31
Arkansas.....	May 1 to October 31
California.....	May 1 to October 31
Idaho.....	May 21 to November 15
Indiana.....	May 1 to August 31
Iowa.....	May 1 to September 30
Missouri.....	May 30 to October 31
Montana.....	May 20 to November 15
New Mexico.....	May 15 to November 15
Vermont.....	May 1 to August 14
Wisconsin.....	May 18 to September 7

June

Utah..... June 15 to October 31

No month

Maine.....	Ice out to August 15
Nebraska.....	No closed season
Oklahoma.....	No closed season
South Carolina.....	No state-wide closed season
Texas.....	No closed season

Operation Rembrandt

(Continued from page 58)

lage or your other arm, or use a maulstick as artists do. (Don't use a beret and smock unless well up on your insurance.) A maulstick is merely a stick with a soft rag wrapped around one end. Rest this soft end in your left hand. Now you will find that you can rest your right wrist on top of the stick and slap the paint right on. Take it easy with the pressure on the stick, even if the end is padded, if your ship is fabric.

Now let's say you are one of those winged-wolves that just doesn't feel natural without a gal along. OK, OK—I can put aside my habitual dislike for such things (Ed. note: Oh, BROTHER!) and give you a few suggestions on this revolting custom.

First of all, unless you *do* have talent you better not try to paint on your own version of a "slick chick" unless you want it to look like one with the "l" left out of the first word. The best way is to copy a gal already done for you in the comics, an ad, or a poster. It is a simple matter to enlarge or reduce these by using scaled-squares. Say you have a cartoon gal you wish to fly around with. Take your ruler and draw horizontal lines across her fuselage from head to toe, being sure to extend them above and below any part that you wish to have transferred. Keep the lines fairly close together, and accurately spaced. Now do the same thing vertically using the same space between the vertical lines as you did between the horizontal lines.

When finished, the entire figure should be covered with a screen of perfect squares. Now then, let's say you wish to transfer the babe—pardon me—young lady, to your plane just twice as big. Pick the area where you want her and then make a duplicate screen of squares but make the squares just twice the size, or as many times the size of the original screen of squares as you want the lady reproduced. When the enlarged screen

of squares has been ruled, take the squares one at a time and copy in it whatever appears in that corresponding square over the cartoon gal. Doing it this way you will only have a few lines in each square to copy. Be sure these lines (which continue from square to square) enter and leave the squares at exactly the same points of the sides that they do in the original. If you follow this simple system, when all the squares have been duplicated you will have an exact reproduction of the gal only as many times larger as you redrew the squares.

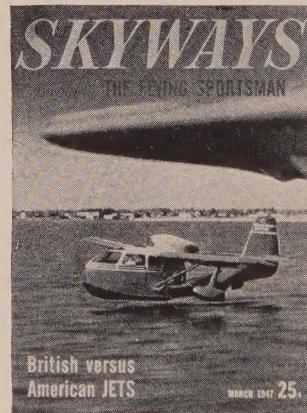
If you have done this right on the plane in chalk or charcoal you may start painting in. If you have been foxy and done this on the sketch paper first, transfer it as you did the lettering by chalking the back of the thin paper and going over the gal again as with the lettering system described before.

Wipe off the excess chalk or charcoal lines if you like before you paint or wait until you have finished painting in the gal. Painting over the chalk lines will not do much harm to the paint applied over it unless the chalk is particularly heavy. Charcoal may darken any light paint applied over it.

Try to keep the gal simple (no insult intended, ladies), with little shading and fancy detail. Use simple solid colors without too much mixing. Paint a background around her or behind her if you like, add a slogan, name, or insignia. Just let your conscience be your guide, mister, it's your ship.

One point more—do not apply dope over the masterpiece, for the oil paint usually cracks, peels and flakes off. Oil paint in itself will stand up for months and you can always touch it up here and there. If you wash the plane and wax it, as you should every two or three months, just wash and wax right over the painting. It will help keep it bright and clean.

OK, Rembrandt, have fun but don't blame me if your slick chick comes out like Lena the Hyena. After all, at 10,000 feet even she might look good.



SKYWAYS PICTURE CREDITS

COVER—This is SKYWAYS first kodachrome in a long, long time. Photographer Rudy Arnold snapped the picture just as the *Seabee* was about to touch down. The Republican amphibian, especially painted for this picture-taking occasion, is a four-place monoplane powered by 215-hp Franklin engine. Of particular interest to sportsman flyers should be the info that before the *Seabee* was NC'd, Republic tested its usefulness as a sportsman's plane by loading it with hunting and fishing equipment and using it on a hunting and fishing trip. It performed beautifully.

The following list gives source of each picture used in this issue of SKYWAYS

10—AAF; 14—BEECH AIRCRAFT; 16, 17—AAF, PRESS ASSOCIATION, WIDE WORLD; 18, 19—INDIANAPOLIS TIMES; 20, 21—HANS GROENHOFF, ROSS-PIX, SANBORN STUDIO; 22, 23—BOB ARENTZ; 24, 25—ROSS-PIX; 26, 27—AVIATION MAGAZINE, INTERNATIONAL NEWS PHOTOS, ROLLS-ROYCE LTD.; 28, 29—CESSNA, ROSS-PIX, C. B. COLBY; 30, 31, 32—MARTIN & KELMAN; 33, 34, 35, 36—TOMMY LARK; 38, 39—CESSNA, GOODYEAR, REPUBLIC; 40, 41, 42—HEMMER; 43—ED HUNTER; 50—INTERNATIONAL NEWS PHOTOS; 52—INDIANAPOLIS TIMES; 64—SKYCRAFT, THE AEROPLANE FROM BRITISH COMBINE, CHAS. E. BROWN, AERO-FLIGHT.

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